ANNUAL REPORT

AND

TRANSACTIONS

OF THE

PLYMOUTH INSTITUTION

AND

Devon and Cornwall

NATURAL HISTORY SOCIETY.

VOLUME V. PART II.

1874–5.

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1875.

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ANNUAL REPORT

OF THE

PLYMOUTH INSTITUTION

AND

Devon and Cornwall Natural History Society.

1874-75.

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SECRETARIES' REPORT.

1874–5.

The Secretaries present the following Report of the proceedings of the Session.

The lectures were—

Oct. 1.	Inaugural Address . .	The President.
„ 15.	Notices of Early Travellers in India	Rev. S. Beal, b.a., m.r.a.s.
„ 22.	Light. Part I. . . .	Mr. W. Square, Jr., f.r.c.s.
„ 29.	Astronomical Measurements, with special reference to the approaching Transit of Venus .	Mr. F. G. Landon, m.a.
Nov. 5.	The Nibelungen Lied . .	Mr. Arthur Shelly.
„ 12.	Notes on Moorland Churches in Devonshire. Part II. .	Mr. J. Hine, f.r.i.b.a.
„ 19.	Ancient Crosses and Inscribed Stones of Devon . . .	Mr. C. S. Bate, f.r.s.
„ 26.	Mineral Resources of Devon and Cornwall . . .	Dr. Oxland.
Dec. 3.	The Church of St. Andrew, Plymouth	Mr. J. B. Rowe, f.s.a., f.l s.
„ 10.	The Siege of Plymouth . .	Mr. R. N. Worth, f.g.s.
„ 17.	The Psychonomy of the Hand .	Mr. R. Woollcombe.
Jan. 14	Notes Illustrative of Species Distribution about Plymouth .	Mr. T. R. A. Briggs, f.l s.
„ 21	California	Mr. Charles Oxland.
„ 28	Recent Discovery of Ruined Temples in India . . .	Rev. S. Beal, b.a., m.r.a.s.
Feb. 4.	The Sagas in their relation to English History . .	Mr. D. Slater, m.a.
„ 11.	Newspapers . . .	Mr. Reynolds Fox.
„ 18.	The Flint and Chert Implements found in Kent's Cavern, Torquay	Mr. W. Pengelly, f.r.s., f.g.s.

Feb. 25.	The principles on which Education should be based . .	Mr. W. F. Collier.
Mar. 4.	The Eloquence of Demosthenes .	Rev. J. M. Charlton, M.A.
„ 11.	Light. Part II. . . .	Mr. W. Square, F.R.C.S.
„ 18.	Shylock, in the "Merchant of Venice," and Barabas, in Marlow's "Jew of Malta," contrasted and compared .	Mr. Montague Bere, Q.C.
„ 25.	The Method and Philosophy of Bacon . . .	Dr. W. H. Pearse.

All the arrangements announced on the card have been carried out except one, when Dr. W. H. Pearse filled the vacancy.

Notwithstanding the severity of the weather, especially during the second half of the Session, the average attendance shows an increase on that of last year, having been over 66.

Nine members and twenty-three associates have joined the Society during the year, the numbers at present being sixty-six members, ninety-one associates, and five lady associates.

Four honorary members have been elected; but we exceedingly regret to have to record the recent death of one of them, the Rev. Canon Kingsley, whose bright talents and energy have so long shed a lustre on his native county of Devon.

At the anniversary meeting Mr. J. Shelly gave an address containing suggestions for a series of historical maps of Devonshire, illustrated by a map of the hundreds and towns in Domesday and the Saxon Chronicle; and a paper was read by Mr. T. R. A. Briggs on the destruction of the flowers of the common primrose by birds; and another by Dr. William H. Pearse showing that a harmony exists between the very widest generalizations of knowledge and our highest wants.

An excursion to Sheepstor, by way of Lee Moor, was made during the summer, which was favoured with very fine weather, and, although not largely attended, afforded much enjoyment to those present.

The Curator of Fine Arts reports that during the past year the Society has received an acquisition in being joined by the members of the Plymouth Fine Art Club, who now hold their meetings in the hall twice a week during nine months of the year. It is sincerely hoped that this will give an impetus to the culture of the arts.

The Conversazione at the commencement of the Session was held as usual; but there was no special novelty in it. Mr. Hall was employed in collecting and hanging pictures, and did his best.

The members of the Plymouth Fine Art Club, desiring to show their interest in the welfare of our Society, suggested that another should be held at Christmas, conducted by themselves, aided by a few of our members. It was illustrated by an exhibition showing the various phases of art study, from the first thought to the finished work. It also embraced a large variety of outline, foreground objects, figures, &c.

A short paper was read by the President of the Club on some of the greater interpreters of nature, dwelling especially on Turner and David Cox.

The exhibition was kept open on the two following days, and was visited by many of the inhabitants of the town.

But this Conversazione must be regarded as supplementary to that of our society. The members of the Club will be always ready to do their utmost to help; but at present they are hardly strong enough to repeat it on their own account twice in a year.

The Curator of the Library states that we are indebted to one of our members, Mr. J. Brooking Rowe, for a copy of the short lived local serial, "Clack"—a work already scarce, though published only in 1865—and for some extremely interesting Tracts, issued during the struggle between Charles and the Parliament. Dr. Jago has presented 4 parts (bound in 2) of Howard's "Barometrographia," which have an additional interest from their having been presented by the author to the late Sir William Snow Harris. Mr. Richard Edmonds has kindly given copies of two pamphlets by himself, one on "The Name Britain and the Phœnicians," the other on "Recent Extraordinary Oscillations in the Waters of Lake Ontario;" and Dr. Merrifield for elaborate printed weather returns.

The following Reports, &c., have been received from the respective societies—"British Association, 1873;" "Quarterly Journal of the Geological Society," Nos. 118, 119, 120, 121; "Journal of the Royal Geological Society of Ireland," vol. iv. part 1, new series; "Proceedings of the London Zoological Society," parts 1, 2, 3, 1874; "Proceedings of the Literary and Philosophical Society of Liverpool," No. 28; "Memoirs of the Literary and Philosophical Society of Manchester," vol. iv. part 3, and several vols. of "Pro-

ceedings;" "Proceedings of the Natural History Society of Northumberland and Durham," vol. vi., being a most interesting work on the birds of the two counties by Mr. John Hancock; "Proceedings of the Berwickshire Naturalists' Club," vol. vii. No. 1; "Journal of the Royal Institution of Cornwall," part of vol. v.; "Transactions of the Devonshire Association," vol. vi.; "Proceedings of the Winchester and Hampshire Scientific and Literary Society," parts 3, 4, vol. 1; "Annual Report of the Zoological Society of Philadelphia;" "Smithsonian Report for 1872," together with "Bulletin of the United States Geological and Geographical Survey of the Territories," No. 1, and "Synopsis of the Flora of Colorado." Dr. Ralfs, of Penzance, and the local Antiquarian and Natural History Society, have presented several interesting Reports of the Society. A correspondence has been opened with two additional societies—the Norfolk and Norwich Naturalists' Society, and the Bristol Naturalists' Society. From the former an interesting volume has been received, and the latter have forwarded vol. i. part 1, of their "Proceedings," "Library Catalogue," &c.

There have been purchased—

"Maclean's History of Trigg Minor," part 8.

"Proceedings of the Palæontographical Society," vol. xxviii.

Blight's "Antient Crosses and Antiquities of Cornwall."

Darwin's "Fertilization of Orchids," "Coral Reefs," "Origin of Species," ed. 6; and Ellacombe's "Church Bells of Devon."

No new serial has been subscribed for.

The Librarian is sorry to add that one or two volumes seem to have been rather roughly handled whilst in circulation.

(*Signed*)

W. ADAMS, } Hon. Secs.
W. BEER, }

TREASURER'S REPORT,

1874–75.

No particular reference is required to the accompanying Balance Sheet, beyond stating that the amount received for Subscriptions is larger than in any previous year. The debt to the Bank remains the same; viz., £100. There is in hand a balance of £17 9s. on account of the Museum Fund, and a balance of £5 on account of the Dartmoor Exploration Fund.

J. BROOKING ROWE, TREASURER.

Athenæum, 1st April, 1875.

INAUGURAL ADDRESS

AT THE OPENING OF THE SESSION 1874-5.

BY THE REV. P. HOLMES, D.D., F.R.A.S.,
President.

Mr. Vice-President, Ladies, and Gentlemen,

§ I. I called attention when I had the honour of opening our last year's session to the unifying tendency of contemporary Science. Generally speaking, this is still true; and I do not know that I need recall or even modify the statement which I then made. But I descry some danger to progress in what may be called *the struggles of Science in the race after Philosophy*, wherein conclusions outrun premises, and theories are mistaken for facts. From the earliest times the human mind has felt a strong desire to fathom the laws which govern the various phenomena of Nature, and to make itself master of her forces. Too long, however, did men wander in this eager and often dangerous pursuit of truth. Beginning with *fanciful interpretations*, they by degrees substituted *hypothesis for fable;* and then, at last coming to understand the true method—(*experimental observation*), they have been able, after innumerable efforts, to give in permanent formulæ the most general idea of the principal phenomena of the physical world. We here see the steps up which the human mind has ascended—*the primitive fable or myth, the hypothetic guess, the objective fact of Science.*

Now I am not so rash as to fear, that we are going back to myths and fables, with an absolute surrender of our intelligence; but it is a curious fact that we hear unusually much of the old mythic thinkers of Greece and Rome—of Democritus, and Epicurus, and Lucretius; and that, too, in the very highest places of scientific authority.

We are thus curiously and unexpectedly brought face to face with ancient mythic thought: I avail myself of my opportunity,

and call your attention to a point which is by no means incongruous to my present subject. Our Institution, in its essays and discussions, pays respect no less to Art than to Science. It is a noticeable fact, that to the same operation of primeval human speculation both these productions of man's mind owe their beginning. In his earliest efforts at classified knowledge, Imagination was his most active faculty; and in its one produce we have the birth both of the scientific myth and its artistic delineation. Thus, it may be said, that *Art and Science are twin-sisters in origin* —both born of man's survey of Nature's mysterious operations. It is worth while to look out for all traces of unity of purpose and character; and here I find it at the very commencement, and all down the progress of mental activity. It is, of course, by different if not opposite methods that man reaches these two well-springs of knowledge, at which to slake his thirst for ideal truth and justice, and to gratify his love of the beautiful. The Artist refuses to dull the brilliancy of his impressions by a cold analysis. The Scientist, on the contrary, in presence of Nature, endeavours to strip off the vesture, however magnificent, with which imagination decks her; he dissects her, though with no rude ungentle hand, penetrates her through and through with keenest investigation; and in the end his enjoyment is not less than the pleasure of the artist, when he has reconstructed in its intelligible whole this world of phenomena of which his power of abstraction and generalisation has enabled him to trace out the laws.* But let us notice more fully the origin of Art. Our Art, in its highest characteristics, is *an exotic of old Greece*, imported through Rome, the parent of European civilisation. The Greek mind was unfettered by dogmatism in its artistic conceptions. Conventional types, which cramped and disfigured the art of Assyria and Egypt, had no influence on the Greek; he kept himself nobly free to catch the fresh inspiration of Nature, whose beauty he realised with an exceptional intensity. He saw his gods in earth, and sea, and sky;† and while ascribing to them all that was best and highest in the noblest human types with which he was familiar, he strove to give expression to his ideal conceptions in ideal personifications of human attributes. Thus Zeus or Jove, the Lord of Heaven, became the embodiment of strength of will; Athené, or Minerva, the protective goddess of wisdom and strength combined; Aphro-

* Guillemin. † D'Anvers.

dite, or Venus, born of the foam of the waves, of female love and beauty; and so forth. And here I would again allude to another but kindred branch of ancient human thought to which I adverted also last year; I mean *Mythology*. This I before associated with the widening science of Comparative Philology, and I referred to the interesting fact of its own fast growth into the perfection of a science, on its own account. "The ancient myth," I said, "everywhere fed the poetic instincts, and gave energy to the primeval languages of men." In now reopening the subject, *I associate Mythology more with Art;* and I think I may say, that in the wonderful productions which have come down to us we find the foundation of the highest Art, which has more or less inspired and instructed our own civilisation in this department. When we study the sculpture of Greece, the double impersonation of *the forces of Nature and the Human attributes* must never be lost sight of; and, in the interest of that unifying connection of the products of human thought, I observe with pleasure what a flood of light has been poured upon those old legends by the researches of modern *philologists*, who have taught us to read *the inward thought* in the outward forms assumed by their language and their art;* so that a great part of our grandest *modern* poetry and works of art can only be intelligible to those who know the ancient mythology.

The comparative study of languages has led us to take more *enlarged views of mythology*. We do not imagine that we can understand the mythology of a *particular* people without examining that of all related peoples. So that a deep philosophy in fact has thus been evolved from what students once considered mere idle tales—beautiful and poetic, but without meaning. The fact is, that in the recently-unearthed languages of the East we have splendid evidence of the identity of our *modern* with the *ancient* races of civilised manhood. Take the structure of the old tongues, and you will find that nearly all the languages of modern Europe can be united in common with Greek and Latin, in a chain of filiated descent with that wonderful sacred language the *Devanagari*, "God-spoken tongue," as its utterers proudly called it, which was once spoken beneath the Himalayas. And again, if you take the LITERARY CONTENTS of these languages, you will discover with

* D'Anvers. The translator properly refers to Cox's "Tales of the Gods and Heroes," and to the works of Max-Müller, Grote, and others.

no less pleasure that they hold the secret of human history at a period prior to all record. The classical mythology, so familiar to us as schoolboys, has its explanation in Sanscrit etymologies; our very fairy tales—our "Puss in Boots," our "Jack the Giant Killer" —can be shown to be *not peculiar to our* own nurseries, but the common property of Eastern and Western children alike, for thousands of years. And in presence of these facts I descry, with no unreasonable enthusiasm, I hope, a new light breaking upon the old confines of history, and an horizon opening, where once brooded impenetrable darkness.

I emphatically impressed upon you last year the fast growing importance of the comparative study of the great Eastern Language, "which has invigorated all languages more or less," and I expressed my conviction that out of the study would arise much elucidation of the prehistoric life of man, illustrating for us the condition of thought, language, civilisation, and religion in the primeval world. I need hardly remind you, how fully my anticipations have been realised. But I must not omit to indicate to *you* the direction which educated thought is taking on the whole subject which has gathered around this Sanscrit Centre; and in doing this, I am entirely within the scope of my present vocation to point out some salient instances of continuous and correlative knowledge, and so to illustrate that unity of science, that growth of a Catholic philosophy, which shall ever onwards advance, in turns instigating, and impelled by advancing thought and thinkers. A year ago, when I had the honour of addressing you on a kindred topic, there was being organised at Paris, under the best help and auspices, THE INTERNATIONAL CONGRESS OF ORIENTALISTS, whose general drift is indicated by this title of their Society. Their object implies the widest *ambition;* this new body proposes nothing less than compassing first Europe, in her capitals, and then other centres of influence in the civilized world. Their sessions are *sectional* like those of our British Association and Social Science assemblies. Thus attention is secured to *special* enquiries in different fields of linguistic investigation, as well as to the demands of *generalisation*, more and more made in the interests of Comparative Philology and Universal Grammar. This year the Orientalists have held their second congress in our metropolis, and the occasion has collected from all quarters the most illustrious scholars of various countries. China, India, Egypt, Persia, Palestine, the classic countries of

Europe, and indeed most districts which have ever yielded a literary language of any pretension, have had greater or less attention paid to their treasures. The general result goes far to illustrate "one of the most remarkable characteristics of our time—the completeness with which every form of human development past and present is being brought within our view, and is influencing our thought." This impulse is in one respect of the same character as that which is daily uniting more closely in mutual intercourse and interest all nations on the face of the earth. Whereas, within a short space of time, nations like the Chinese, or those of Central Asia, were regarded as living a separate life, with which we felt merely a commercial or some very inferior interest, we are now aware *that they all have their place and their influence in* THE ONE GREAT HUMAN FAMILY. We feel a similar interest in the past, and research is daily revealing to us how largely (to use a new term due to these enquiries) our thoughts and speculations and habits are mere *survivals* of the past civilizations of men. Interesting discussions on many points of Biblical and Archæologic value have been held by scholars of highest eminence—in the sections whose very names are suggestive—the *Shemitic*, *Turanian*, *Dravidian*, and *Humitic;* but the section, which naturally enough proved the most popular, was THE ARYAN, or Indo-Germanic. Over this presided one of our great Sanscrit scholars. His inaugural address is a complete essay on the general relations of the Sanscrit Language and Literature to the civilization of our Western Races. Few discoveries have ever caused more astonishment than *that* which our own scholars first—Sir W. Jones, Colebrook, Wilson,—and then the Continental savans of Germany and France, made, that the despised Hindus were in possession of a literature more ancient, more copious, and more diversified than the classic literatures themselves of Greece and Rome, and that their sacred books yielded in antiquity to the Bible only. Philosophic speculation too had pursued an identical course by the Himalayas and on the shores of the Mediterranean—that even the Greek philosophers had been anticipated by Hindu sages; and the very doctrines of atoms and elements had been elaborated on the banks of the Ganges. I have done my humble share, in this Institution, on former occasions towards describing *the linguistic specialities of Sanscrit*, and in displaying some of the beauties of *its sacred, moral, and dramatic literature.* In those particulars I cannot repeat myself now; but I will conclude this

portion of my address by calling your attention to one or two points arising out of the new enthusiasm gathering around the subject. One of the pleasantest results of the discovery is the beneficial influence which begins to show itself on the Hindus themselves: they have risen in their own esteem since they learned that their ancestors were almost teachers of our teachers in Greece and Rome, and that they may become themselves the peers of Greeks and Romans and Saxons. It is certain, that they have betaken themselves in a new spirit to the study of their own literature. Indeed out of their treasures has arisen a revival everywhere of a more exact knowledge amongst literary nations. WE *study our* OWN ENGLISH with more critical eyes and keener relish. It is a noticeable fact, that the happy revival (I might almost call it, the *formation*) of a scientific estimate of our own beautiful language originated with the philologists of Germany, Denmark, and France, who derived their own critical efficiency from the enlarged field of view opened to them. And now OUR OWN scholars are impregnated with the scientific spirit; so that there is hardly an elementary book for our school children, touching even the earliest rudiments of our English and French and German and Latin and Greek Grammars, Dictionaries, and Lexicons, but is richly illustrated and improved by the learning which Sanscrit has furnished. Philology, the outcome of Sanscrit, has in fact opened out to us our linguistic relations, not simply to our own Anglo-Saxon, but to every cognate tongue in the great Aryan family, I must say there is the promise in the long run. From this spirit of reciprocity and union of great results, MORAL AS WELL AS INTELLECTUAL; and I might almost add, that if RELIGION does not receive a new sanction from this impulse and effort after concord, it at any rate finds a fresher hope of ultimate success, and an encouragement which is likely to overbear and even supersede its apparent failures in the past. Professor Max-Müller, who is a great Philo-Indian, fairly exults in the prospect; and at the Orientalist Congress he threw out some valuable hints how *missionary* travel and labour might well be utilised. Let missionaries be thoroughly learned in Indian scholarship; let some of the non-resident fellowships of Oxford and Cambridge be given to graduates (lay or clerical) who will take up this kind of work; their religious qualifications obviously need suffer no diminution, nor their zeal be relaxed. The result could hardly be other than successful. In more ways than one successful, they

would come through the breadths of the world, whither their loving search for men would lead them to dying languages, no less than living and dead ones. Our fathers (who lived with old Dolly Pentreath and her ancestors among them) know by the decadence and dissolution of the Old Cornish, what a "dying language" means. It is really important to obtain accurate information about the language (and in *the language*, of course, are involved *the life*—both secular and religious) of decaying tribes of mankind. No one can tell what knowledge, which might hereafter turn out to be of incalculable worth, may be year after year permitted to die out for want of collection and record. "At Rome," said Max-Müller to the International Orientalists last week, "in the time of the Scipios, hundreds of people might have written down a grammar and dictionary of the Etruscan, Oscan, and Umbrian tongues" (then decadent in out-of-the-way places up and down the Apennines, as our Old Cornish was the other day). "But there were men then, as there are now, who shrugged their shoulders, and asked: 'What can be the use of preserving these uncouth and barbarous idioms?' What," reasonably adds the Professor, "what would *we* not give now for some such records?" Cornish, thanks to Dr. Bannister and other loving philologists, has its record, and its remains will enter the fibre of Celtic philology; but we are lost in conjecture, when we try to understand the old predecessors of Latin in the Italian peninsula. With knowledge of a race's language, thought, and sentiment, deeper sympathy and a surer way to the heart would arise; and so practical a philanthropy would lead, if not to the reception of Christianity, at any rate to the lessening of prejudice; and nothing but better feeling could arise out of the better understanding. And thus comparing languages together, and examining literatures, and discovering that man is our *fellow* everywhere, in all the capacities of his intellect and aspirations of his heart, a sharer in our common hopes and fears, sympathies and antipathies, nations (we may hope) may learn to esteem and respect each other with a true and kindly humanity.

§ II. I pass to other topics. Most of us watch with interest the voyage of H.M.S. *Challenger* on her scientific expedition. Not only are we informed by her soundings of the contours of the Ocean Depths, but we are told of the strange things in *Fauna* and *Flora* which her dredges bring to light. Last year I quoted Dr. Wyville Thomson as opening up in the discoveries links of life

connecting the present with past geological ages, some of the animal contents of the dredges being described as "closely allied to, and apparently descended from the Fauna of the early Tertiaries." Similarly we have an almost startling evidence of continuity in terrestrial formation afforded in Dr. Wyville Thomson's interesting essay on "The Continuity of the Chalk formation," wherein the author seems to have proved (against some objections of Murchison and Lyell) that "the chalk of the Cretaceous period and the chalk-mud of the modern Atlantic are substantially the same. There can be no doubt that we have forming at the bottom of the present Ocean a vast sheet of Rock which very closely resembles chalk; and there can be as little doubt that the old chalk—the cretaceous formation which in some parts of England has been subjected to enormous denudation and which is overlaid by the beds of the tertiary series, was produced in the same manner, and under closely similar circumstances—and not the Chalk only, but *most likely all the great limestone formations.* In almost the whole of these, the remains of FORAMINIFERA are abundant, some of them apparently specifically identical with living forms."* Important facts relating to *Physical Geography* have also been placed beyond doubt in these Deep-Sea Researches.† "We found," says Dr. Thomson, "that, in these two areas of the North Atlantic, (which freely communicate with each other, and are in immediate proximity,) *two entirely different conditions of climate exist at all depths* below the immediate surface, where, indeed, they differ but slightly. In the Faëroe Channel at a depth of 500 fathoms the bottom temperature averaged 1° *centigrade*, while at the same depth in the Atlantic the minimum index stood at 6° *cent.*, a difference of 7 degrees *cent.*, nearly 13° Fahrenheit."‡ Truly there is no *finality*

* "Depths of the Sea," page 470. † Ibid, page 307.

‡ Instances of glacial currents were adduced at the British Association meeting at Belfast. Dr. Carpenter exhibited a sectional map of the sea between Nova Scotia and Bermuda, showing isothermal lines. These lines were tilted up at the Western end, indicating the existence of a cold current between the American Coast and the Gulf Stream. This tilting up was interpreted by Dr. C. as due to the earth's rotation, combined with the fact that this cold stream flows from North to South. A similar phenomenon was mentioned as found off the East Coast of Japan, where there exists a cold aqueous band between the Japan current and the land. On the Dogger Bank there is also a difference of 15° Fahrenheit in five fathoms. Mr. Gwin Jefferies thus explains why *Arctic shells* had been dredged on the Dogger Bank!

for us in our attainments of Physical truth in any of its scientific branches. Not only in earth and sky, but in the watery realms beneath, facts come to light of no isolated worth, but such as possess wide-spreading relations, and show an unresting progress in Nature's great habitude—of unity amidst variety, and the variety even contributing to the unity. Here are these Deep-sea soundings and the treasures of the dredge. What weighty facts they bring to the surface! what undreamt-of mysteries they reveal! Take merely the two I mention in my brief sketch. You have in closest proximity two ocean areas with totally different bottom climates; and you are discovering abundant animal life at all depths. Surely such facts have most important bearings upon the distribution of Marine Life, new chapters have to be added to our Natural History; and our Geology has to be modified in its interpretation of palæontological data. The lover of Science, however, welcomes the facts with delight, and yet unmisgiving composure. As he looks forward to the ultimate unification of the '*Totum scibile*,' with unswerving faith in the harmony of God's Universe—when the territorial sciences shall yield a universal philosophy, he accepts the affluence of facts which are being always gathered in, undisturbed in mind, though his preconceptions are constantly disturbed, and quietly rearranging his conclusions with every accession of his premises. From such quietness and confidence comes the strength of patience for fresh research and the assurance of ulterior discoveries and ultimate convictions. In regard to the disquietude, indeed, which discoveries offer to old opinions, I may refer in passing to the possible effect of these very Chalk phenomena of the Atlantic on the chronology of Geology. The word '*Revolutionary*' has been used to describe the apprehended effect. "All the symmetry of geological time will be destroyed," says a recent scientific reviewer,* "if the cretaceous system is to run up the *eocene*, the *miocene*, the *pliocene*, the *pleistocene*, and the *recent;* and we must cease to call these by the name of 'periods;' as they may merely indicate localities or variations of sea-depth. And if so, may not something analogous have occurred when the lower rocks were forming? May there not be other cases where depths of ocean have been mistaken for *depths of time?* In other words, may not many geological formations, hitherto described as *successive* deposits, have after all been actually progressing *simultaneously?*"

* "Journal of Science," vol. x. p. 526.

We may both here, and in other of our scientific deductions, probably find hints to check our dogmatism, but nothing to extinguish our faith in general scientific conclusions.

Other startling paradoxes come to view in other departments of Science. I cannot refrain from alluding to Dr. Hooker's "Carnivorous Plants," which he described in what was perhaps the most attractive paper at the Belfast meeting. It was delivered in the Biological Section of the British Association, and had the curious but significant title of "The Carnivours Habits of some of our Brother-organisms—Plants." These plants are a race of which we have well-known instances in the Sundew (*Drosera*) and Venus' Fly-trap (*Dionaæ*). The fact that small insects get entangled and killed in their hairy or sticky leaves has long been familiarly known. But it is only lately that lively interest has been awakened in this, as in so many other familiar facts, by Mr. Darwin's researches and beautiful descriptions. It seems that this entanglement of the insects is no accidental circumstance, but that the plant actually kills, eats, and digests them. An American botanist, Mr. Cianby, had actually fed a *Dionaæ* with small pieces of beef. The leaf closed upon the morsels as if they were insects, and after a while they were found to be completely dissolved and absorbed, the leaf opening again with a dry surface, and ready for another meal, though with an appetite somewhat jaded. Moreover, the plant has no more control over its appetite than a human being. It was found that cheese horribly disagreed with the leaves, turning them black, and finally killing them. With these facts in view, the contrivances in the plant for the capture of its prey acquire a new interest. They are often most curious and intricate; and Dr. Hooker held his audience in rapt attention, while he described, and with the aid of numerous diagrams made them clear. The single instance of the *Dionaæ* may suffice as a specimen. It was thus described long ago by Ellis, an English naturalist, who in 1768 sent a drawing of it to Linnæus: "The plant shows that Nature may have some views towards its Nourishment, in forming the upper joint of its leaf like a machine to catch food. Upon the middle of this lies the bait for the unhappy insect that becomes its prey. Many minute red glands, which cover its surface, and which perhaps discharge sweet liquor, tempt the poor animal to taste them; and the instant these tender parts are irritated by its feet, the two lobes rise up, grasp it tight, lock the rows of spines together,

and squeeze it to death." This description, indeed, has not been confirmed in all its details by later observations, but it expresses very vividly the general type of the plant's capturing apparatus. The point to which Dr. Hooker drew attention was the singular proof herein afforded of a fundamental similarity between the protoplasm of plants and the protoplasm of animals. *If both can in some instances draw their nutriment from the same food, so that the usual order of things is inverted, and animals are made food for vegetables, instead of vegetables for animals, then these phenomena of carnivorous plants may find their place as one more link in the continuity of Nature.*

In turning aside from this to different topics, I would simply allude, in passing, to the steady progress of observation by the *Spectrum Analysis*, and to the attention which Astronomers are paying to the complicated subject of Solar Physics. The great centre of our Astronomical system is receiving from all quarters examination into its Mass and surrounding conditions, which cannot fail to modify and yet advance the science of the Sun; and from the great central body forth into space there are advancing discoveries of extreme interest and importance. One of the most remarkable of *these* is the settlement of the fact, that meteors, shooting-stars, and ærolites have taken their place among the attendants of the Sun, whereas we had been in the habit of looking upon their phenomena as meteorological and not astronomical. There was not much to attract attention to these bodies when they were supposed to form one or two rings occuping a position in space very nearly coincident with that of the Earth's orbit. But it has now been placed beyond a doubt that the Earth encounters fifty-six systems at least of these small bodies; and these systems are found (in the instances as yet examined) not circular rings, but ovals of great eccentricity extending far into space, in some cases even beyond the orbits of Uranus and Neptune. Nor is this all. It is supposed to be extremely probable, nay, certain, that such systems are to be reckoned, not by tens, or fifties, or even hundreds and thousands, but by millions upon millions. So it seems, that the interplanetary spaces, so far from being looked upon as untenanted, except by an occasional wandering comet, must be considered as crowded with various forms of cosmical matter. If an eye, armed with powers of sufficient vision, and placed at some far-distant point could only see at one glance all the systems

which occupy our solar domain, they would appear as a complicated net-work formed by interlacing streams of cosmical dust. And amidst the streams of misty light representing cometic and meteoric systems, the planets would shine forth as distinctly and as brilliantly as the brighter stars on the background of the Milky Way. How wonderful are the far-reaching developments of this magnificent science! Again, *there is no finality;* we must be ever learning and unlearning. There was true prophecy in the exclamation of La Place, who, although knowing more of the celestial mechanism than any man then living, said earnestly on his deathbed, "That which we know is little; that which we know not is immense." At first sight it might seem as if this immensity, which we speak of, but cannot conceive, would paralyse study, effort and practical result. But no! It is the glory of true science, that however magnificent be the outreachings of great theories and principles, these principles are in themselves energetic if only true. And thus no advance is made in Astronomical doctrine which is not sooner or later utilised. I may quote as an instance from Mr. Lockyer's recently published splendid volume on "Solar Physics."* On the connection between Solar and terrestrial meteorology "Mr. Meldrum," he says, "a distinguished meteorologist, who lives not in the temperate zones of the earth, where the meteorological conditions are irregular, but in the torrid zone (where meteorological phenomena and among them cyclones abound) tells us that it is no longer correct merely to associate cyclones with the tropics. He tells us that the whole question of cyclones is a question of Solar Activity, and that if we write down in one column the number of cyclones in a given year, and in another column the number of sun-spots in any given year, there will be a strict relation between them—many sun-spots, many hurricanes; few sun-spots, few hurricanes. And only this morning I have received a letter from Dr. Stewart, who tells me that Mr. Meldrum has since found that what is true of the storms which devastate the Indian Ocean is true of the storms which devastate the West Indies; and on referring to the storms of the Indian Ocean, Mr. Meldrum points out that at those years where we have been quietly mapping the sun-spot maxima, the harbours were filled with wrecks—vessels coming in disabled from every part of the great Indian Ocean. Now all this," continues Mr. Lockyer, "is something worth considering;

* See pages 423 and 431.

because if we can manage to get at these things, to associate them in some way with solar activity, so that there can be no mistake about it, then the power of prediction—that power which would be the most useful one in meteorology if we could only get at it—would be within our grasp." The writer concludes with this practical question, "What is necessary in order to discover the true nature of this *nexus?* Two things are necessary, and they are these. In the first place we must obtain an accurate knowledge of the currents of the sun; and secondly we must obtain an accurate knowledge of the currents of the earth. The former of these demands the united efforts of photography and spectrum analysis; and the second of these demands the pursuit of meteorology as a physical science, and not as a mere collection of weather statistics. When these demands are met by the apt and practical resources which are called into play by the pressure of fresh discovery, we shall have a science of meteorology placed on a firm and useful basis—the Meteorology of the Future." To make perfect science, however (that is, to arrange it in method, and bind its parts together with the ligatures of logical sequence), requires the mathematician as well as the physicist. It is the glory of our age that even this resource is not unlikely to be forthcoming in the right moment. Professor Jellett, of Trinity College, Dublin, who presided over the Mathematical Section of the British Association at Belfast, in his interesting address, referred to the readiness shown by mathematical analysis to extend its instrumental powers.

Mathematics exercise already a considerable power over some sciences. They rule in Mechanics, Optics, Hydrostatics. Is there any probability of their extending their sway into the domains of Chemistry or Biology? The question implies another one. How far does the *method* of modern science favour the practice of assuming an hypothesis—to be accepted or rejected, according as it bears the test of subsequent application to facts? For this is what the Mathematician, whose reasoning is essentially *deductive*, requires. Gravitation is an hypothesis which has been completely verified by all facts to which it has been as yet applied; and it forms accordingly the sure basis of *Astronomy*. Optics wholly rests on hypothesis. The definition of Light—the waves which are assumed to produce it—the very ether itself which is the material of these vibrations, are all hypothetical. But these hypotheses, mathematically stated, are found to furnish a satisfactory account of

actual phenomena, and are therefore (at any rate provisionally) adopted. Is there then any other hypothesis which may enable Mathematics to push its sure methods into other provinces? There is one which is now making rapid progress, and which seems likely to have a far-reaching influence. It is that of Molecular Mechanics. The *molcule* is the smallest portion of any substance still retaining all the qualities of the substance—the smallest possible drop (for instance) of water. It is incapable of further *mechanical* subdivision, though not of *chemical;* for the molecule of water may be still torn asunder into its constituent atoms of Oxygen and Hydrogen. Molecular Mechanics, then, is the new science which deals with the movements of these ultimate particles of all bodies. Now, *since motion is* always capable of mathematical expression, it is evidently calculated to extend widely the domain of mathematical reasoning; for *motion appears to be more and more that into which all forces are ultimately resolvable.* Sound is the vibration of air, Light is the vibration of ether, Heat is nothing but the minute and invisible movements of the particles which make up the heated body; and Professor Williamson has almost proved that *Chemical combination itself* is nothing but an incessant union and separation of these same minute particles from different bodies. If so, Chemistry itself is destined to fall under Mathematical Rule, even as Biology has already partially fallen, in consequence of those muscular movements which have been recently very ably treated by Professor Haughton. But all this, it will be said, rests on the molecular hypothesis, and that involves a deep and ancient—and still unsettled, controversy whether matter is *infinitely divisible*, or whether it can be separated into ultimate particles beyond which further division is impossible. Well, this is not exactly a correct statement of the case. Molecular *Dynamics*, remember, is indepependent of this controverted hypothesis. *Its equations are true*, whatever be the particles it deals with; *e.g.* whether they are ultimately particles or not. The only difference is, that in the first case its statements are complete and perfect, in the second case they are only tending towards completeness. Mathematicians have a powerful instrument in the Differential Calculus, which expresses the limiting forms to which equations tend, as the quantities which compose them are continually diminishing, so that its statements are independent of the actual value of these quantities. Molecular Dynamics may thus be regarded as the Differential Calculus of

Physics, or *the science of motion* in its widest and largest significance. I have given you this sketch of an eminent authority's view of the office of Mathematics in giving finish to exact science, because it is in more ways than one important, that the subject should be borne in mind by all who are interested in the progress of scientific thought and opinion. Much passes under the weighty name of Science, which at best is nothing more than opinion more or less probable. And this brings me back to the apprehension I expressed, at the beginning of this address, that our scientific investigations are not seldom restless, rather than active, fanciful rather than certain—impatient to draw out desired results, and to clinch preconceptions, rather than contented to search and store facts, and quietly to await the conclusions, which by correct inductive process may truly be extracted from the evidence. With not a shred of prejudice (if I do not misunderstand myself), but rather with a sincere admiration, influenced by my high estimate of him as a brilliant expounder, both by experiment and exposition, of physical science in some of its highest phases, I could not but partake of the unfavourable estimate so largely formed of Professor Tyndall's celebrated address at Belfast the other day. I censure him, not from any theological bias of my own, or from any idea that his religious opinions are other than I would have a Christian's be. Of *this*, I think, his address affords no decisive evidence one way or the other; and most certainly his position at the head of the British Association was no place for any reference to any subject of such a nature. The occasion was *scientific;* the object which he had to direct was *scientific;* the whole domain of ascertained *science* was at his command, and his audience was *scientific*, through and through. But yet his address *was not scientific;* it seemed to be worse than not scientific, for it was a perversion of science. Exquisite in style, as all his writings are apt to be, his address was indeed most pleasant reading—if its purport had been a mythological or poetic rhapsody; or a day-dream visioning forth the possible future of an all-embracing Molecular theory, in which Mind and Body are to arrive at the vanishing point, not of union or correlation, but of identity; and all physical conditions are to be resolved into physiological development. But there is much to be done before such a possibility can even be thought of, except by those, whose prejudices are strong enough to throw down the barriers of true scientific examination, and to jump over all legitimate requirements of logical method to

the much-wished-for conclusion. One thing to be done is to eliminate from the mind the theological sympathy and antipathy, which are too apt to distort the judgment and to lead to passionate conclusions. Science and religion must be kept *distinct* in all processes of scientific research and conclusion. Any reciprocity of interference between them would endanger confused enquiry and hybrid results. I have heard Professor Tyndall's failure at Belfast attributed to imperfect mathematics. He possesses a vivid *scientific imagination*, if I may use the phrase, unweighted with the ballast of Mathematical judgment. At a dash, he will assume a conclusion without the anterior premises, and is apt to confound anticipation with achievement. Mathematics, as I have said, are far too precise an instrument to allow the least opening for such confusion in the scientific mind. I have no objection to Molecular Science in itself; nothing can be more appropriate for discussion in institutions like the British Association, or our own Institute; but we can dispense with references to Democritus, or Epicurus, or Lucretius, as authoritative on our judgment. The Professor fairly warns out of court all interference of Christian Divines (they are supposed to be incapable of forming an unprejudiced opinion); then why does he subpœna the sceptics of old Greece and Rome to give evidence in a case where their conclusion was a foregone one against the religion of their countrymen? If he must bring up his Lucretius—an exquisite writer and deep thinker—why does he not adduce Cicero and other ancient writers, who have been often thought to have confuted the Lucretian doctrine? But I forbear. I have thrown out a hint, which some of you may improve. It would well employ an evening to discuss the old physical doctrines of Greek and Roman philosophers, and compare them with the curious recurrence of similar opinions now, as defended by our Darwins, and Spencers, and Huxleys, and Tyndalls. "*Nothing new under the sun*" has received another voucher for its truth; and thus *the ends meet again*, the fanciful conjectures of thinkers, whom we greet (with respect and due allowance) on the threshold of philosophy, and the poetic prolepsis of our nineteenth century authorities, who (as if they scorned or despaired of the direction of contemporary thought) sought for that countenance of authority, which all desiderate, in the fellowship of the Ancients, whose names have traversed the periods of the history of human opinion. But men are apt (curiously enough) to recur to antiquity, in other ways and for other purposes than one; let

me, as there is some little excuse for me *in the association of the ideas*, though not in the subjects, advert to ancient researches which learned enterprise happens to be making all the world over in unearthing the remains of Ancient Cities. Ever since the discovery of Pompeii and Herculaneum, stage after stage of these interesting researches has been going on. Sir Charles Fellowes in Lycia, then Botta and Layard in Assyria, other explorers at Ephesus, Rome, Athens, Carthage, and lately on the scene of the Olympic Games, and again Schliemann on the plains of Troy. Jerusalem too, and other parts of Palestine and Syria, have been subjected to a still more elaborate investigation.

Nothing can be more satisfactory. *Modest* scepticism is often wholesome; but there is a scepticism which is simply the selfish gratification of an unyielding temper, and, when applied to history or any received archæological fact, exults in doubt and denial, and ends in the absolute rejection of historical testimony and record. Well, it is remarkable how uniform is the tendency of these recovered remains of ancient sites and things to vindicate the statements of History, whether classical or sacred. And thus we observe two parallel currents setting steadily in opposite directions. Our atomic philosophers run to the old physicists to furbish their paradoxes with the halo of Ancient Opinion; and our Archæologists spring their mines of research, and by their substantial discoveries chase away the negations which assail our most cherished belief and opinion. This too I throw out as a suggestion, which I would gladly see take shape in a paper and discussion on one of our evenings.

And now I have done; not in a way equal to my wishes, or the dignity of the occasion, but as my abridged opportunities (and I may say indifferent health of late) have enabled me. Called upon suddenly on an occasion which caused us all sincere regret, after an ineffectual struggle I consented to discharge the duties of the chair another session, and I know I shall experience as indeed I shall much require your indulgence and help in the discharge of them. I desire to set an example (however feebly, yet most sincerely) in helping forward the interests of our beloved Institution. For sixty years it has, in its place and method, done valuable service in our town and neighbourhood. I have observed in others, and experienced in myself (in a humble measure), the great advantage of our proceedings. We all in our happy England prize the privilege of freedom in the formation of our opinions, and liberty in the expression of them. Well, *here*

we have a school for the acquisition and rehearsal of these accomplishments. During nearly a third of a century I have had the honour of membership in our Institution, and have of course had many opportunities of observing the satisfactory progress which individuals have made in the above-mentioned acquirements; how they had advanced from the primitive state of timidity and stuttering to the perfection of easy assurance and ready eloquence. And closely allied to this independence of judgment and speech is the Englishman's *responsibility of opinion.* Savages may be free in the sense of rough and irresponsible action and speech, but it is the perfection of our civilised habits to live in personal liberty toned by neighbourly responsibility. Well, here again I have, happily, another recommendation which appertains to the Plymouth Institution; for we not only propose our own opinions on the most important subjects of Literature and Art and Science, but we submit them to the opinions and judgment of our brother members; and we often enjoy the opportunity of correcting and modifying our own thoughts, and acquiring the precious lesson of modesty in the tenure of our principles. A word to the younger members of our society. During my long career here I have observed many vicissitudes in its fortunes; never perhaps has it stood in more hopeful prospects than now. We hand on to your care and zeal a valuable heirloom and I entreat you to guard it, and even improve it still. Let many among *our Associate Class* determine to elevate themselves to the higher class of *Lecturing Members.* This higher class requires replenishing; and whence can be supplied the recruits so well as from the cognate but junior class? I am counselling you to this slight increase of service and devotion, not without some right and title to do so. This is my nine-and-twentieth lecture in the service of this institution. I have seldom, if ever, flinched when called on by the secretary to bear my burden in the annual duty of lecturing. If the duty has entailed labour, the labour has brought its own reward; the necessary research has added to one's useful knowledge; the discussions which have arisen have quickened the thinking powers and imparted accuracy and precision to the thoughts. And it is worth while to add that this mental exertion has not been unattended with moral results, in encouraging patience and moderation in the formation of our own opinions, and a courteous and kindly toleration of the convictions of others, whose intelligence at once entitles and enables them to question our sentiments, and to uphold their own.

EARLY TRAVELLERS IN INDIA.

ABSTRACT OF REV. S. BEAL'S PAPER.

(Read October 15th, 1874.)

THE lecture related to the earliest recorded notices of the geography and religion of India. First, as derived from the few words found in Scripture, where we read that the kings of Persia had extended their authority to India; and also that Solomon brought apes and peacocks from the same country.

The next notice we have of this country is the mythical account given by Arrian and others respecting the invasion of Bacchus (Dionysus) and Semiramis.

The Greek records of the visit of Megasthenes to the court of Sandrocottus at Patalibrotha (Patna) bring us within the historical period.

Alexander's invasion, which took him as far as the Hydaspes (Chenab), is also a valuable guide so far as it goes; but as he did not reach the Ganges, its value is somewhat confined.

The most minute and accurate information we possess is derived from the travels of Chinese Buddhist pilgrims who visited India during the early part of our æra.

Of these, two are specially valuable; viz., the travels of Fa-hian (A.D. 399) and Hwen Tsang (A.D. 600). The former passed down the Ganges, and took ship for Ceylon, whence he returned by sea (*viâ* Java) to his own country. The second passed through every province of India from north to south, and during fourteen years' residence in the country acquired an accurate knowledge of Sanscrit.

It is from the published records of these travellers that our knowledge of India prior to the rise of Islam is now chiefly derived.

ASTRONOMICAL MEASUREMENTS

WITH SPECIAL REFERENCE TO THE TRANSIT OF VENUS.

ABSTRACT OF MR. F. G. LANDON'S PAPER.

(Read October 29th, 1874.)

THE determination of the distances of the heavenly bodies is not a question of *practical* utility, as the application of astronomy to navigation and kindred pursuits depends only on the *relative* distances and positions of the heavenly bodies, and the calculations of the nautical almanac can be made with the minutest accuracy without the *absolute* distances appearing as an element in the problem. Still the human mind can set itself no higher task than to search out the mysteries of the universe, of which our earth forms so minute a part; to send out a plummet into the vast depths of the universe, which shall not only tell us how far we are from our sun, but will in time help us to know the mighty sweep of its path round its far distant centre. The first unit of measurement to be determined is the diameter of the earth, the next the diameter of the earth's orbit, and the last the diameter of the sun's orbit. The first may be considered known; the second is resolved with approximate accuracy, and it is the object of the approaching observations of the transit of Venus to render the approximation closer. The third can only be determined in the course of ages. The sun's distance depends upon its parallax, which is the angle between two lines drawn from the sun, one to the eye of the observer, and the other to the centre of the earth. By Kepler's law, the parallax of the sun or any planet being known, that of the others can be found. The parallax of the planets Venus and Mars can be found, and hence the parallax of the sun and other planets can be deduced. By the transit of Venus in 1769 the parallax was found to be 8″.57, which gave the sun's distance 95,378,000 miles. But more recent observations have suggested 8″.93 as the true parallax, which gives a distance of 91,533,000 miles. The means used for finding the distance of the sun fail when applied to the

stars; but though a globe of 8,000 miles in diameter subtends no appreciable angle at the nearest star, yet a distance of 183,000,000 miles, which is about the diameter of the earth's orbit, causes a measurable change in the apparent direction of some of the stars, and this is called their *annual* parallax. The nearest star α Centauri is found by this means to be 210,000 times the earth's orbit in distance. Should the path of the sun ever be determined, the *secular* parallax of a star would be the angle subtended by the diameter of the sun's orbit at the star, and by its means the distance of all stars in our own sidereal system might be determined.

The rest of the lecture was occupied with explanations of the circumstances under which transits of Venus occur, the causes of the unequal intervals of time which elapse between successive transits, the phenomena which attend a transit, the best places for observing the transit of 1874, an explanation of the methods to be employed; namely,

1. Halley's method, or the method of *durations*.
2. Delisle's method, or the method of *absolute time*.
3. The Photographic method.
4. The Direct method.

A comparison of the advantages of these methods respectively, and a description of the various expeditions fitted out for the purpose of observing the transit by England, America, Germany, Russia, France, Italy, and Holland respectively.

THE NIBELUNGEN LIED.

ABSTRACT OF MR. ARTHUR SHELLY'S PAPER.

(Read November 5th, 1874.)

The most remarkable feature in the history of German literature is the occurrence of two periods of culmination or flowering. Of the first blooming period, the Nibelungen lied is the fairest flower. It has come down to the present time in ten perfect manuscripts and eighteen fragments. The earliest of these is of the thirteenth, the latest of the sixteenth century. These manuscripts are divided into two groups, the first distinguished by a finer style (lesart), the second, or vulgata, by a rougher style. They are all probably copies of two entirely independent manuscripts dating 1190–1200, which again were rewritten (bearbeitet) from an original dating 1150–70.

This original is supposed to be the work of a certain Von Kuerenberg, to whom fifteen stanzas in the Nibelungen metre are ascribed. Up to the middle of the thirteenth century, a metre invented by a poet was considered his own property, and was never used by others. This fact alone makes the common authorship of the stanzas by Kuerenberg and the Nibelungen lied highly probable. The original materials of the poem are of high antiquity. The first part, up to the death of Siegfried, is of mythological origin. The second part seems to rest upon slight historical foundation. In the years 435–437 the King Gundicarius of Burgundy was defeated by Aectius and driven eastward, when he fell into the hands of the Huns, and was cut off with twenty thousand of his subjects. The names of Gibica, Godomarus, and Gislaharïus occur in history as princes of Burgundy. Here we find the Gunther, Gernot, and Geiselher of the Nibelungen lied, and the King Gibich, father of Kriemhild, of the Heldenbuch. The marriage of Clotilda, the Christian princess of Burgundy, with the heathen King Clovis, the murder of her father and other relatives by Gundobald her uncle, and her revenge on Sigmund his son, with the final downfall of the kingdom of Burgundy, may have furnished ground for the conclusion of the Nibelungen Sage in the German version. The Siegfried Sage is contained in the Nibelungen lied in a very imperfect form. It is to be found in the account of the Hoernerner Siegfried, in Dornroeschen, and in the northern Sagas. Siegfried, of the race of the Voelsungen (valis, Gothic, chosen, distinguished), is the personified expression in the myth of the milder side of the force of nature. He is the conqueror of the winter storms and restorer of peace to the earth. The Nibelungen Hort, or treasure, are the blossoms and fruits of the soil. The dwarfs, who keep the treasure, the hidden earthy influences. Brunhilde is the beclouded sun whom Siegfried re-awakens. Siegfried is united with Kriemhild, daughter of the Nibelungen king. But the earthly antagonistic forces reconquer, and Siegfried dies; the treasure is sunk in the deep, and all again becomes dark and wintry.

These ancient materials, first fashioned into a poem or poems by the minstrels or saenger, and afterwards into a finished work of art by an author who, whatever his name, possessed deep poetical feeling, are stamped with the ineffaceable and undying features of German national character. They may furnish, says a modern German poet, employment for centuries yet to come.

NOTES ON MOORLAND CHURCHES.

Part II.

BY JAMES HINE, F.R.I.B.A.

(Read November 12th, 1874.)

The notes I have now to lay before the Society are chiefly on churches on the eastern border of Dartmoor, those of North Bovey, Manaton, Chagford, Buckland, and Widecombe-in-the-Moor. In many of their leading characteristics they are not unlike the southern and western moorland churches which I have already described, but are not without local and special peculiarities.

At first sight it would seem remarkable that, not only throughout a district or county of England, but throughout the British Islands, and throughout the whole of northern and western Europe, the same styles of architecture prevailed in the middle ages, only varied by certain local or national marks, and that throughout this large portion of the civilized world the same changes and transitions in style occurred at much the same periods. This will appear, however, the less remarkable if we remember that the Church—the foster-mother of architecture, and from whom art drew her chief inspiration—was then universally acknowledged. The people of civilized Europe, fully believing in one Catholic Church, and knowing no other, could well be satisfied with one style of architecture; *one*, and yet magnificent in ever-varied forms and details.

It is the variety and beauty of the idioms, if they may so be called, of this mediæval architecture,—so varied and so beautiful that no two churches are alike, and every church, however humble, has some individual interest,—which make miscalled Gothic architecture so attractive to the mind and the imagination, rendering the study of it a pleasurable enjoyment in this unromantic and prosaic age.

I have now to speak of some of the idioms and peculiarities of these churches on the eastern border of Dartmoor.

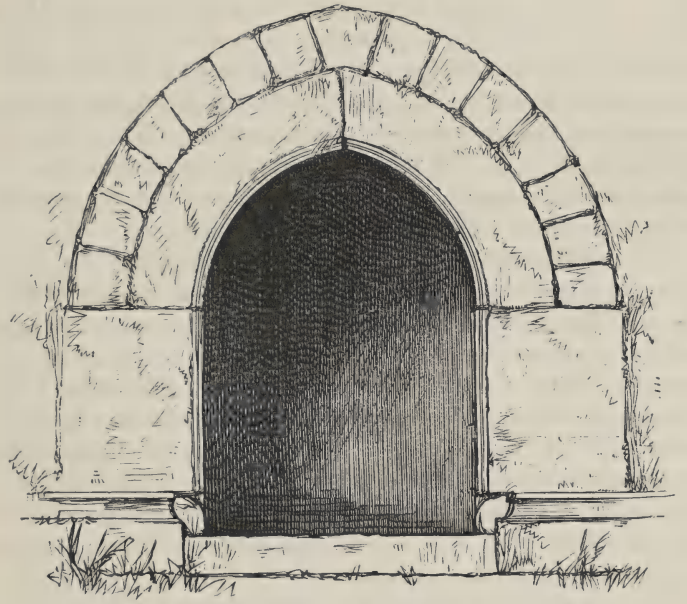
The cathedral at Exeter was, of course, the great glory of the diocese and county, and from the erection of its Norman towers down to the fifteenth century, the best available talent was employed on its construction; and painters and sculptors, not

only from distant parts of England, but probably from France and other parts of the Continent, were from time to time engaged on the building. We can trace the influence of their work in some of the parish churches both of Devon and Cornwall, and even in the outlying moorland churches, at least in such portions of them as are Norman and Early English. We have beautiful fragments of Norman masonry in South Brent and Meavy churches, which were originally cruciform in plan, and were built not long after the Norman portion of the cathedral.

As I have before remarked, the Norman and Early English sculptors and masons worked almost and invariably in freestone, from Caen, Beer, and other known quarries far and near; but they most carefully avoided granite. I find little trace of their work in these eastern moorland churches; in fact, after a few lessons in style, the moorland builders were, no doubt, left pretty much to themselves. And no wonder! Nobody but a moorman to this day knows how to handle a boulder. He has a knack of breaking it up, and working it into a wall or hedge, most adroitly, which an ordinary mason has no idea of. A man may, and does, take a pride in working in granite as in anything else, but it is laboured and not very entertaining work. The best of the carving on Widecombe tower, or Probus tower, is rude, compared with that on the Somersetshire towers or on those in Devon which are of freestone. The sculptor wants a tractable material to deal with, and likes to see his handiwork follow his thought and fancy more quickly than he possibly can when working in granite. So the moorland carvers had it very much to themselves, and so also the masons. Their work is good of its kind, and for the material used, but it is not always very exact. Tracery sometimes fits awkwardly on mullions (as in the west window of St. Andrew's, Plymouth), or perhaps one of the very large quoin-stones of a moorland church is an inch or two out of the perpendicular, or there is the difference of an inch or so in a joint made up with slate or coarse mortar; but then it is *granite* work, and also the work of rough moorland builders, who did their best with their own hard and rugged native material.

A noticeable feature of the churches under review is a fifteenth-century doorway formed of four immense granite stones—two arch-stones meeting at the point of the arch, and two jamb-stones. At Buckland-in-the-Moor, Bickington, Manaton, North Bovey, and

Chagford, these doorways are to be found chiefly in the west walls of the towers. There are two at Chagford. The Rev. Samuel Rowe describes the one at Manaton as of almost Cyclopean character, and round-headed. This is not so. All these arches are two-centred and pointed. Both jamb and arch-stones are double-chamfered on the outer edge. The former are about $2\frac{1}{2}$ feet wide by $3\frac{1}{2}$ feet high, and the latter about a foot and a half wide by $4\frac{1}{2}$ feet long.



West Doorway, Manaton Church.

One can imagine how the masons of the different parishes vied with each other in the construction of these massive doorways, and what rivalry there was as to the sizes of the stones, and the accuracy of the working; how Chagford would boast that Bovey doorway "bain't so big as ourn by six inches in length, by two in width," or *vice versa*. That such emulation existed even in this out-of-the-world district there can be no doubt.

The little church of *Buckland-in-the-Moor* is chiefly remarkable for the beauty of its situation, and for the good proportions and somewhat quaint design of its tower, which is Decorated, and of

two stages, without buttresses, and with the stair-turret in the *centre* of the south face—an arrangement not very common, though it is repeated at North Bovey, where, however, the turret is in the centre of the north wall of the tower. The Buckland tower tapers, and, though devoid of ornament, is exceedingly picturesque, and is an object of interest in a landscape of surpassing beauty.

North Bovey is a good Perpendicular church, though much disfigured by plaster outside, and intensely yellow wash inside. It consists of nave (of four arches on each side) 46 × 18, north and south aisles 58 × 10, and chancel 28 × 12, with a tower 22 × 21 of three stages, with stump pinnacles. The rood screen is in fair condition, and that portion of it opening into the choir is carved around with figures of the twelve apostles in niches, and with the conventional foliage between. How great must have been the delight of the carvers of this screen in their work, and in anticipation of the *Te Deum* being sung for centuries within its precincts, with that acclaim which they symbolized,—

"The glorious company of the apostles praise Thee!"

There is no doubt that the greater part of the fine and elegant work in these churches was done by these carvers, who realized in wood what the masons were unable to any great extent to produce in granite. Whether they worked as members of a guild, or in family groups, or in a more isolated way, certain it is they attained to great skill and excellence in their art. What gave impressiveness to the chancel in the Devonshire churches, was not its loftiness or the elevation of the altar (it was seldom raised more than three steps), but the *screen* with which it was invested. Rogers expresses the idea in two lines—

"Approach with reverence. There are those *within*
Whose dwelling-place is heaven."

The nave of North Bovey Church is almost entirely occupied with the original oak seats of the fifteenth century, and very fine, and massive (no "nicely-calculated less or more" about them), and rich in colour, they are. Even in the best of our modern church seating there is thinness and a certain economical though dainty look which you do not see in this old work. I have seen modern book-boards only half an inch thick, and scarcely strong enough to bear the weight of an old woman's prayer-book with her pocket handkerchief round it, much less her elbows. Here at North Bovey it is three inches thick, and the carved bench ends are $3\frac{3}{4}$ inches thick.

On the north wall of the chancel is a tablet with this inscription: "Here lyeth y^e^ body of Thomas Parr, Rector of this parish 29 years, who was buried January y^e^ 12th, 1733; and at his death gave five pounds to y^e^ poor day labourers of this parish; and likewise three pounds yearly for y^e^ education of poor children of y^e^ said parish for ever, to be paid out of y^e^ estates lying in Higher Langdon, after our life." One would think that £3 yearly would not go very far towards "y^e^ education of y^e^ poor children of y^e^ parish;" but then there are no great multitudes of children in moorland districts, and possibly their education, a hundred and forty years ago, was even more elementary than it is now under the new act.

In the north chancel aisle windows at North Bovey are remains of ancient painted glass, including the emblems of the four Evangelists.

Scarcely inferior to the situation of Buckland is that of *Manaton Church* and village, rocks, woods, and rugged tors contributing to the wildness, and even grandeur, of the scenery. The church is a handsome Perpendicular structure, showing no signs of an earlier foundation, and consisting of nave, of three bays with four centred granite arches and piers, north and south aisles, and chancel. The rood screen is even finer here than at North Bovey, and retains its original colouring and gilding, now toned down and producing an exceedingly rich effect. May it never suffer the misfortune of repainting, or so-called restoration. In the panels are portraitures of saints and bishops, disfigured, it is said, by the stabs of Cromwell's soldiers. Likely enough, however, a good deal is put down to Cromwell's men that more justly may be attributed to the Vandalism of post-reformation Churchmen.

The roofs were originally all of the waggon kind, and the nave roof is a rather fine example. The south aisle roof has been ceiled perfectly flat and plain, like a workhouse corridor. In the north chancel aisle are three original oak benches of 15th century work, and of curious form. The south porch is exceedingly handsome, with a fine groined roof and parvise over. Externally this porch, and the rood staircase, and the south aisle, are surrounded by embattled parapets. The tower, 20 feet square, rises to the height of 90 feet, and is of good proportions, in three stages. At the top are battlements and pinnacles.

Of all the churches in this border Manaton is perhaps the best built, though not the most interesting archæologically.

In the churchyard, at the eastern end, and on the south side

entering from the lich-gate, is the base of the ancient churchyard cross. The piers of the lich-gate are old, and the roof is modernized and shorn of much of its original picturesque appearance. The gate is flanked on each side by a massive granite seat, eighteen feet in length, with a coped back, also of granite, of the same date as the church. These curious-looking and uncommon seats, with the church and grand old yew tree in the background, and the cottages and village green in the foreground, make up a picture of rare interest. Here the villagers, old and young, await the arrival of the squire and his family on Sunday mornings; here the village lads and lasses meet to exchange their vows, and to repeat the honied words familiar to all the descendants of Adam and Eve; and here the mourners pause and rest a moment when bringing a corpse for interment, as though unwilling to take the one step more into the churchyard, and to say "adieu" to the loved one.

Chagford Church, like Manaton, is entirely Perpendicular, and consists of nave (of five arches on each side resting on octagonal piers), north and south aisles, chancel, with north and south chantry aisles. There is no chancel arch; indeed not one of the churches here described possesses this feature.

The church has been fairly restored of late years; but with doubtful taste, to say the least, the eastern window of the north aisle has been cut away to allow of an opening into a new vestry, which has been built in continuation of this aisle eastward. Here too, as at Manaton, the new pews have low doors—an unfortunate necessity, it is presumed, and a concession to bucolic prejudice.

The aisle windows are all three-light, and of excellent character, with good moulded scoinson arches within. The east window of chancel is five-light, and there is a square-headed one over the chancel door. The roofs are all waggon-shaped, with good bosses at the intersection of the ribs. Portions of the screens on the north and south sides of the chancel remain, but the cross screen is entirely removed.

On the north side of the sacrarium, close up to the east wall, is a large and elaborate Elizabethan monument to the memory of Sir John Whiddon, judge of the King's Bench, whom Risdon describes as "a man of high stomach, and well read in the laws of this land." The inscription is: "Here lyeth S. John Whiddo, Knyght, a judge of y^{e} Kynge's Benche, who ended this life the 27th of Jan. anno. dom., 1575."

On a slab inserted in the chancel floor: "Here lieth Mary the daughter of Oliver Whiddon, Esquire, who died the 22nd day of October, 1641.

"Reader, wouldst know who here is laid?
Behold a matron, yet a maid;
A modest looke, a pious heart,
A Mary for the better part.
But drie thine eies;
Why wilt thou weepe?
Such damsels doe
Not die, but sleepe."

The tower is of considerable height, and has a plain, but good, arch opening into the nave at the west end. Externally the tower is also plain, and has four short pinnacles at the top. There are six bells, which were cast by Bilbie in 1766.

The Church of Widecombe-in-the-Moor, dedicated to St. Pancras, is, on account of its size and the beauty and importance of its tower, sometimes called "the Cathedral of the Moor."

The romantic scenery around, with the rugged tors of Honeybag, Bel, and Chinkwell, rising above the village, is made still more picturesque by the noble granite tower of the parish church, and the quaint and thoroughly old English almshouses on the north side of the village green. What true artists were the mediæval architects! whose works, so far from detracting from the beauties of nature, actually emphasize and supplement them, and are points of interest in almost any English landscape.

Widecombe Church is throughout Perpendicular in style, the eastern portions of early character for the most part, and the tower and much of the work in the north and south aisles, including the square-headed windows, late Perpendicular. The extreme internal length is nearly 104 feet, and the plan consists of nave, west tower, north and south aisles and transept, chancel, with north and south chantry aisles. Vestry on north side of north chantry. Porch on south side. Excepting, perhaps, some fragments of masonry in the transept, there is no existing work earlier than that of the fifteenth century.

The chancel is 23 feet in length, by 15½ feet in width, and has an east window of four lights, with double tracery and a quatrefoil in the head. The roof is of the cradle kind, so usual in Devonshire, and has many of the original bosses, which are carved and painted. The subjects are heads, flowers, and leaves: one has a half figure

of S. Catherine. It is to be regretted that in the restoration of this chancel during a former incumbency the original wall plates, which were of much interest, and had on them figures of heads, the white hart of Richard II., and a griffin, were destroyed, and ordinary stained deal plates substituted for them. I do not presume to attribute blame to any one in this matter. It is possible that the plates may have been too much decayed to have allowed of their being refixed; but it is a fact, nevertheless, that when such things disappear, the artistic and historical interest of a building goes largely with them. It is impossible to restore a church in too conservative a spirit.

The south window of the chancel is square-headed and of two lights. Below it is a priest's doorway, which is cut diagonally through the wall to leave space for the piscina. This is an arrangement to be seen in neighbouring churches. There is a square-headed sedilia, and an aumbrey.

The upper portion of the roodscreen has been destroyed, but the lower panels remaining contain figures of our Lord, SS. Peter, Thomas, Bartholomew, James, and Sebastian. Also a king and queen, and several bishops and doctors of the church. A four-centred moulded granite arch communicates with the aisle on each side of the chancel, the arch resting on an octagonal pillar having a plain splayed capital.

The roofs of both north and south chancel aisles, and of the transept, are of the cradle form also; and though in a sad state of decay, are of interest as retaining all their original features. These particular roofs were never open to the ridge; indeed, the original oak boarding to the arched ribs remain. The bosses contain flowers and fruit, and show some exquisite bits of carving, and the cornices are well moulded with flowers set on hollows.

Below the intersection of the transept and aisle roofs, and over the opening to the former, are moulded arches formed of oak. These are unique features which should be most carefully preserved.

The east window of the north chancel aisle is of three lights. The label springs from two heads, and at the point of the arch is a head of the Virgin crowned. In the tracery of this window are fragments of ancient glass with the Courtenay arms and St. George's Cross. The east windows of the transept are three-light also, and are the earliest and best in the church; indeed, there is a Decorated character about them.

The arcade on each side of the nave consists of five bays. The portion of the roof which covers three of these bays westward, is between four and five feet higher than that of the eastern portion of the nave, and this double level of the nave roof has a peculiar external appearance. It may be accounted for in this way: the tower is of later date than the church, and is said to have been voluntarily built by a company of successful tinners who had worked some neighbouring mines. They did not regard cost, and were only desirous that their tower should be, as it is, the glory of the Moor. They gave it, therefore, an elevation of more than ninety feet, and designed a lofty arch to open into the church; which arch, however, they found rose considerably above the then existing roof of the nave. Thinking, perhaps, more of the tower than of the appearance of the rest of the church, they raised the western portion of the roof (both of nave and aisles), leaving the eastern part on its original level. This supposition is borne out by the appearance of the masonry, and the indications in the north and south aisle walls that the sills of the windows have been raised. There is nothing, in my opinion, to bear out satisfactorily the other conjecture, that the church originally terminated further eastward than now, and that the three bays were added when the tower was built. The pillars, arches, and roof, all correspond in detail, and the masonry of the tower is almost independent of that of the chancel, showing clearly, I think, that it was a separate erection.

For beauty of proportion this tower has been compared to Magdalen Tower, Oxford; and for sharpness and finish of detail it probably may rank first amongst the granite towers of the west. It is in three stages, and from the plinth to the parapet is exceedingly bold and effective in style. It terminates at the top with a fine battlement, and large and handsome octagonal pinnacles five feet in diameter, each crocketed and surmounted with a cross.

This noble tower, built by men who gave of their wealth to God, and who said—

> "High heaven rejects the lore
> Of nicely-calculated less or more,"

has suffered no injury from time, or the ruder hand of the so-called "reformer;" but it is sad to see the church erected by our pious fathers of the fifteenth century, not only now shorn of its original embellishments and of much of its proper furniture, but in places actually in a ruinous and dangerous condition. Something has already been done towards its restoration, but much more is required.

MINERAL RESOURCES OF DEVON AND CORNWALL.

EARTHY MINERALS.

BY R. OXLAND, PH.D.

(Read November 26th, 1874.)

For the convenience of systematically reviewing the mineral resources of Devon and Cornwall, we shall do well to use, to some extent, the classification commonly adopted in works on Mineralogy. At present all substances are known to be resolvable into about sixty-seven elementary forms, known as simple substances or elements. Very few of these are ever found in Nature in the elementary form, but in a form disguised by combination with other substances, which possess few, if any, properties in common with their constituents. These simple substances, when combined with each other, are said to be *mineralized.*

On reviewing the list of elements, we shall find but very few that are not to be found in the two counties in some form or other. I am not aware of the discovery as yet in Devon and Cornwall of Platinum, Osmium, Palladium, Rhodium, Rubidium, Tellurium, or Thallium. Mercury is as yet doubtful. The recent discovery of it at Exeter is not as yet admitted as proof of its natural occurrence. So that out of the sixty-four elementary bodies, about fifty-four are of more or less common occurrence in the two counties.

Commencing first with the consideration of the most common minerals, I may possibly excite some surprise by beginning with Water. Its claim to our attention consists in its being the most abundant and most useful mineral. It has been regarded as a metal —Hydrogen mineralized by combination with Oxygen. Referring to Chapman's "Mineralogy," page 11, we find it thus described: "Water, Oxide of Hydrogen. Sp. gr. 1·00. When pure, tasteless and inodorous. C.P. (*i.e.* constituent parts), O. 88·94, H. 11·06." Its localities are air and earth, sea and sky. It is absolutely essential to our existence, constituting more than 0·9 of our system.

Of its many valuable properties its most remarkable, and probably its most valuable, is that of mobility. It can be readily changed from the solid to the liquid, from the liquid to the gaseous, and from the gaseous back again to the solid, and consequently can be transferred from one locality to another with the greatest ease.

Its principal source of *supply* is the ocean. The sun is our earth's great steam-engine, always at work pumping up water from the ocean, transferring it to the land, depositing it in store-houses on lofty mountains 5,000 to 25,000 feet high. The mountains act as the surface condensers of steam-engines in restoring water from the invisible form in the rarified atmosphere, approaching considerably towards a vacuum. Precipitated in the state of snow, it is further condensed and solidified into the form of ice in glaciers, in which condition it is preserved until the increased heat of the summer's sun unlocks these mountain storehouses. In Devon and Cornwall the mountain ranges are comparatively insignificant. They do not reach very high into the atmosphere; nevertheless, from their proximity to the sea, and their peninsular arrangement, they become the agents of supply of much more than has yet been fully utilized. On the extensive moors of Dartmoor and Exmoor there are vast spongy coverings of peat which serve instead of glaciers to store up water in vast quantities, sufficient for the constant supply of many rivers. For want of proper consideration, this mineral has not yet been utilized to anything like the extent to which it may be applied. Very often we hear great complaints of the inconveniences occasioned by the excessive supply of this valuable material; nevertheless, but little has yet been done to properly utilize that which is obtainable. In order to understand this, we shall do well to devote a few minutes to the consideration of the purposes for which water is required. They may be considered under two heads; viz., mechanical and chemical.

Taking Nature as our teacher, we may apply the mechanical properties of water for the purpose of disintegrating masses, as is done extensively in the two counties, as we shall presently have occasion for illustration in noticing the methods of obtaining and preparing china clay; but very much yet remains to be done to obtain the full value of the supplies of water obtainable for such purposes. To fully appreciate this, we should note what is being accomplished elsewhere. In California, for instance, in "hydraulicing," or hydraulic operations, many joint stock companies are in opera-

tion simply for the purpose of collecting water where obtainable, and conveying and distributing it, over districts where it is required for metallurgical operations. One company alone, the Eureka, has more than 200 miles of ditches, or water-courses, distributing nearly 8½ million cubic feet of water in 24 hours, or 237,165 tons. The cost of the plant amounted to upwards of £250,000. The greater portion of this water is consumed in breaking down old river beds cemented together by lime, mud, &c., in order to the separation of the gold contained therein. In a single work as much as 4,000 to 5,000 tons of gravel are broken down in 24 hours, and profitable results have been obtained, although the "dirt" produced only 3 cents, or 1½d. worth of gold per ton (15 cubic feet). The rent paid for the water used, amounted to $70, or £14 per day—£4,200 per annum. In supplying water for such purposes the Eureka Company has spent upwards of £40,000 per annum, and obtained a net revenue of profit, after paying all expenses, of upwards of £30,000.

It appears that the cost of handling a cubic yard, or nearly two tons, is about ¼ or ⅓ of a penny per ton. Throughout Devon and Cornwall we may see very extensive arrangements for the utilization of the mechanical properties of water, but as yet nothing to be compared with those erected within a very few years in the modern mining districts of California and Nevada. We need not go far from Plymouth to see examples of the utilization of water. At Devon Great Consols are two very fine water-wheels worked by water taken out of the Tamar for the purpose of driving a portion of the river to the top of the hill, where it is used in a variety of ways which will serve to illustrate the properties and uses of water.

The portion of the river which passes over the wheels immediately returns to the stream, and the value of the work done by it is sufficient to allow of the mine paying the Duchy £500 per annum for being allowed to take the water out at one point and to restore it at another. The portion of the water thrown to the top of the hill by plunger pumps through large cast-iron pipes is discharged into a large reservoir, whence it flows over a water-wheel employed in driving the machinery of a foundry and smith's shop. Another water-wheel, driven by the same water, is used for conveying the men by man-engine some 300 fathoms, or 1,800 feet, in depth to their work, and in bringing them back again when their day's

work is done. After this the same water is employed for washing the ores, and in driving the machinery used in working furnaces for the extraction of arsenic and sulphur from the ores, in grinding arsenic, in working saw-mills, in supplying the boiler of the crushing-engine, &c.; and finally the water finds its way back again, after having been utilized as much as possible, into the river. All this water is raised by one of the large wheels. The work of the other wheel is to move a long line of iron rods of immense strength, stretching many hundred feet, from the wheel to the top of the hill, where it is connected with a long line of pumps, which extend to the bottom of the mine, for the purpose of lifting out the water which is constantly collecting there. The passing Tamar is thus made to do the work of the Devon Great Consols Mine, and its value can only be fully appreciated when, during dry summer seasons, the body of water passing through the river is so much diminished as not to give power sufficient for working the pumps. Then the big steam-engine, kept in readiness for such an eventuality, has to be set to work, and the consumption of tons of the 'black diamond' is required to replace the work of the absent water. In most mines in Devon and Cornwall, the smaller the rainfall, the smaller the coal bill; but here exactly the reverse—the greater the rainfall, the smaller the coal account.

We need not go further than this mine to see abundant examples of the *chemical* utilities of water. The water pumped from the bottom of the mine is thrown, not to adit—*i.e.* to the nearest outlet above the water-shed of the neighbourhood, or the nearest valley—but is brought up to the highest ground on the mine. If we dip the blade of a knife into it we shall find that it will quickly become covered with copper. Every gallon of this water, or 70,000 grains, contains about 7 grains, or $\frac{1}{10000}$ part, of copper. On bringing this water into contact with old iron, the sulphuric acid combines with the iron, for which it has a preference, converts it into the liquid form as sulphate of iron, and leaves the copper in the form of a metallic powder. The coppery water is distributed over the surface of old iron (placed in a circular tank) in fine showers, by the rotation of hollow perforated arms like the brewer's aspersor used for mashing malt. The movement is effected by the gravitation of the water itself, so that the mechanical and chemical properties of the water are rendered available for the production of useful effects in the same apparatus. A portion of the iron is recovered from the

water by so exposing the solution of the iron, after the copper has been precipitated, as by the oxidizing action of the air to mineralize it in the form of a persulphate, which by drying is eventually obtained in the form either of a yellowish brown ochre, or, by further exposure to heat and calcination, a rich purple or reddish-brown colcothar, or crocus, or peroxide of iron.

We cannot afford time for more than a mere enumeration of some of the uses of water in the economy of a town such as Plymouth; such, for example, as for the production of power, either directly by water-wheels or turbines, or indirectly for the steam-engine. In passing through the town we find engines at work sawing timber, grinding corn, making flour, baking bread, printing newspapers, manufacturing sugar, starch, oils, paints, colours, rolling lead, hammering iron, breaking stones (turning stones into bread), spinning, weaving, washing, dyeing, making soap, loading ships, unloading them, bringing into the town and taking away men and things; and so familiar are water-engines becoming now that we cannot have the comfortable finishing touch to a hair-dressing and headache-dispelling without the aid of the little turbine-driven circular brush. We have, moreover, water to drink in all its varied forms of tea, coffee, beer, cider, wine, &.; water to eat in every form of food, especially of bread, the staff of life. We want water for cleansing person and raiment, house and furniture.

It is not until the supply is partially cut off that we even begin to appreciate the value of this substance. Although comparatively a fair supply of water is obtained in this town, yet the increased consumption is now pressing for serious consideration of the best means of improved supply. Our Dartmoor hills present peculiar facilities for obtaining this supply. There are localities amongst the hills where the waters that so abundantly fall on them may be *stored up* in artificial lakes in any quantity, whence supplies may be led off as they may be required, instead of its being allowed to run away as it falls in its course, frequently causing injury and destruction to property. Since the recent great advance in the price of coal, the importance of water as a source of power has greatly increased.

One of the principal mineral resources of the two counties is china clay. In 1872 the quantities of china clay raised in Cornwall in 106 different china clay works amounted to 141,000 tons; and in Devonshire, from nine different works, to 26,982 tons. Mere

figures will hardly convey a just idea of quantity; we may be able to grasp it by supposing it all laden at once in railway trucks, for which nearly 17,000 would be required, forming a train of nearly fifty miles in length. With this article there is another raised and shipped in the same locality with it in considerable quantities. I refer to china stone, of which the production in Cornwall alone in 1872 amounted to 48,000 tons.

The principal places of shipment in Cornwall are Par, near Fowey, 52,407 tons; Fowey, 19,770 tons; Charlestown, a very small place, near St. Austell, 52,407 tons; Pentuan, in the same neighbourhood, 20,671 tons; Falmouth, 29,587 tons; Plymouth, 17,238 tons. The principal localities from which it is obtained are the granite hills of Devon and Cornwall. In Cornwall the largest works are in the neighbourhood of St. Austell, not far from Burngullow Railway Station, which is essentially a china clay station. In passing through it on the Cornwall Railway we may always see very large quantities of china clay and china stone ready for shipment.

To show how this valuable material of china clay is obtained, I must ask you to accompany me in description to the Lee Moor China Clay Works, near Plympton, the largest in Devonshire. The first indications of our approach to the works we meet with at a bridge crossing the Tory Brook, where we see the rushing stream, white as milk. About half to three-quarters of a mile farther up the hill we reach the stopes, a sort of amphitheatre, surrounding a flat piece of ground of some ten or twelve acres or more in extent, through which we find a rapid stream of milky water flowing, in a water-course bounded by ridges of coarse sand, which have been evidently thrown up from the bed of the stream. Indeed we may see the men engaged in this operation at the stopes, where they are at work on the slanting faces of the low cliff, some thirty or forty feet high, loosening the masses with a peculiar form of pickaxe, so as to allow the water which is falling over the edge of the cliff to permeate the masses, and to wash out the clay from amongst the stones, large and small, constituting the cliff. The larger stones, consisting principally of quartz and schorl, are thrown aside; but the clay, with the gravel and the sand, is carried off in the water. Soon the gravel begins to settle, leaving the sand and clay to flow on. As the speed of motion of the water is moderated, the sand settles out, and then the fine

clay, with fine silica and the glistening mica, pass on. The speed of the water is still further reduced, and the mica, or the "shine," settles out; and finally, by passing through a set of long troughs, where the speed is reduced yet more, the "mica," really the fine silica, settles, and only the china clay proper is allowed to flow on into large settling-tanks. After the clay has settled so as to leave the water bright and clear, the water is run off, leaving the clay with as little water as possible. From these tanks, when sufficiently settled, the clay is drawn off in a pasty condition into large drying-pans, constructed of fire-brick sides, and fire-clay tiles for the bottom, under which circulate flues from a large fireplace, leading off into a high chimney, whence we see little else but steam passing off. In this pan the clay is sufficiently dried to allow of its being cut into cubical masses of about 12″ cube, when it is lifted out, and transferred either direct into railway-waggons or into sheds, where it is kept until required for transport to place of shipment. Near the drying-places are large depo-its of thousands of tons of the refuse mica and sand, of which as yet only a very limited consumption has taken place.

If we examine the ground in the stopes before it is disturbed, we shall find that it much resembles a rotten granite, inasmuch as it contains the same constituents as granite, but not in an indurated condition. The question has been raised, but not yet settled, whether we should consider it as a decomposing granite, or as an imperfectly formed granite which has never as yet attained an indurated form. I have seen rocks apparently solid and compact which on the touch crumbled to pieces, this effect having been produced by the exposure for an undefinable period to the action of hot water, which probably contained carbonic acid in abundance, and possibly small quantities of fluorine. May not these formations be attributable to similar actions? The evidence may be as yet incomplete for forming an opinion, but this theory may help investigation of accompanying phenomena. Elvans and metamorphic rocks may be found traversing granite ranges, and are they not indications of volcanic action sufficient for the supply of hot water? If we watch the working of the stopes we must notice the large quantity of dead work; *i.e.* useless material that has to be removed for the recovery of saleable produce. This will vary very much according to different localities. Thus from 10 to 20 per cent. only may be returned; *i.e.* for every ton of market-

able china clay from 5 to 10 tons of useless matter, in the shape of overburden—rocks, stones, gravel-sand, mica, and shine, have to be handled at considerable cost. At the Lee Moor Works this cost is considerably abated by the utilization of much of the sand, mica, and coarse clay in the manufacture of large quantities of a very superior fire-brick, which has deservedly obtained a very high reputation, not only in this country, but also on the Continent. In some localities in Cornwall where water is scarce, the water run off from the clay is pumped back again to the higher level for use over again. In other localities where it is abundant it is a question whether great economy in labour would not be effected by the adoption of the Californian hydraulicing system, by which the clay might be washed out without the labour of digging.

The large quantities of refuse Mica deserve consideration as to the feasibility of application to some useful purpose. It consists principally of silica and alumina, with from 8 to 14 per cent. potash. If by some economical process this potash could be set free, it would be a valuable agricultural material.

China stone is principally raised in the neighbourhood of St. Austell. It consists principally of quartz and silica, with felspar and little, if any, mica. It is used for the manufacture of glaze for china, the china clay being reserved for the production of the body or biscuit ware. The principal localities of consumption of china clay are the Potteries in Staffordshire, and the cotton mills of Lancashire. It is used principally in the production of earthenware and china, but is also employed in the manufacture of alum, of ultramarine, of paper, and what is technically termed bleach in the production of cotton cloth, on which it is pasted for the purpose of producing body and colour. It has a limited consumption also in the manufacture of paper hangings.

It is largely exported to the Continent—to France, Germany, and Russia—and also to the United States.

It is said to have been at one time used in this country in the adulteration of flour. I have reason to suspect that on the Continent it is still used for this nefarious purpose, as some time since, amongst other samples of mineral offered me for sale by a German house was one which, under the denomination of Pierre Mort, I found to be china clay, and the use of which I found on inquiry was for the manufacture of ship biscuits.

The value of the 216,000 tons of china clay and china stone

raised in Devon and Cornwall in 1872, delivered at the works where used, would be nearly half a million sterling. The consumption last year was, I believe, considerably greater than in 1872, and it appears to be still increasing. As a large proportion of the value consists in the cost of carriage, any improved facility of conveyance facilitates its production. On this account, the opening of the South-Western line of railway, which passes through a portion of Dartmoor, hitherto inaccessible, will be likely to lead to the undertaking of new works for its extraction and preparation.

In addition to the kaolin, or china clay, there were also produced in the district about Bovey Tracey and Newton 52,141 tons of pipe and potter's clay, conveyed by water from Newton to Teignmouth, and there shipped. Within the last four or five years an extensive series of manufactories have sprung up on Hingston Down, near Calstock, and some other localities in Cornwall, of firebrick made from a coarse clay not fine enough for the production of china clay. Some quantity of clay is consumed on the spot at Bovey Tracey in the manufacture of fine fancy pottery, and at Watcombe, near Torquay, for the production of Terra Cotta goods. There is a small pottery still at work at Coxside, producing rough brown and red ware, and a few common brick manufactories may be found spread over the two counties. In Robert Hunt's "Mineral Statistics" a curious particular appears; viz., 375 tons of candle clay consumed in one year simply for the purpose of wrapping around and holding candles burnt for miners' underground purposes. The clay for this purpose is obtained preferably from the high ground of St. Agnes or St. Ann's Beacon.

I have already devoted so much time to the consideration of water and clays that I must content myself with the bare enumeration of some of the other earthy minerals which constitute sources of wealth in the two counties, such as limestones, marbles, slates (roofing and common), granites, greenstones, porphyries, elvans, serpentine; sands from rivers used for building and other purposes; sea-sand used as a source of lime, on account of the *débris* of shells contained in it, for agricultural purposes; muds, or silts, used for agricultural purposes, or capable of being employed in the manufacture of cements.

THE CHURCH OF ST. ANDREW, PLYMOUTH.

BY J. BROOKING ROWE, F.L.S.,
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(Read December 3rd, 1874.)

In endeavouring to compile a history of the old parish Church of Plymouth, I am, until a comparatively recent period, groping very much in the dark. It is somewhat remarkable that in a town of so much importance as Plymouth the records should be so few; and it is quite as remarkable that the Church, occupying as it did a position of such prominence, not only in relation to the town and the Priory of Plympton, but to the whole diocese, should have so few records that throw a light upon its early grandeur. Such is, however, the case. The merest reference here and there in a State paper, a passing allusion in the pages of a chronicler, a few entries in the account-books of the town, are the only sources of information until we are well on in the seventeenth century.

And yet perhaps, on consideration, this is not so strange when we recollect to what the town has from time to time been exposed. Frequent incursions by the foreigner, domestic strife, royal robbery, and puritanical violence, have all had their part in interfering with, injuring, and destroying the records of the past. Added to this the carelessness of the custodian, and his ignorance, have done their worst here as elsewhere.

Until late in the last century I imagine that Plymouth must have possessed a large quantity of ancient documents; but when the preparations for the erection of the building, now the old Guildhall were being made, no care whatever was taken of the papers in charge of the then corporation; they were scattered about in all directions, numbers were thrown into the street, played with and destroyed by children, and the greater part were hopelessly lost.

There is little doubt that many of these would have thrown a light upon my subject; for the town authorities, the mayor and his brethren, appear to have been always intimately connected with the Church of St. Andrew. In my "Ecclesiastical History of Old Plymouth," I referred more particularly to the bye-law passed in the third mayoralty of Thomas Grayson with reference to the copes and vestments. The money received for the use of these was to be taken by the churchwardens, and expended upon the copes if necessary, and to the use of the church generally, under the supervision of the mayor and wardens.

Again, in 1499, wardens for the steeple, otherwise the tower, were appointed by the mayor; but this was only for a special purpose, I think, and no subsequent appointment was made. But in other ways the governing body was interested in the church and church property both before and after the Reformation. In connection with the Gilds of the town, this is very evident, and it is most annoying that we have but the slightest traces of such Gilds. Plymouth, unless it was different from almost every other town, must have had several of these; but references to two, or perhaps three, only are to be found.

A Gild was a society or voluntary association of persons formed for the purpose of promoting the common interest of those so banded together. It was an institution of local self-help, which took the place to a great extent of the modern friendly or benefit society, but which had much higher aims; paying attention not only to the particular object of its formation, but to religion, justice, and morality, as well as to the assistance of the needy. The Gilds were found in every walk of life, and for the promotion of many objects, and we find in almost every town one or more existing. By some it has been stated that the Gild was the origin of the Borough. This is not however the case, although frequently the two became mixed up together, and frequently the Gild law became the law of the town.*

We have traces of Gilds in Plymouth, besides crafts connected with them. Two of these were of importance—those of Corpus Christi and of Our Lady and St. George. Both were, no doubt, closely connected with the Church of St. Andrew, the former unquestionably so. While the one was essentially a Gild formed for a specially religious purpose, having in all probability been instituted

* Toulmin Smith.

in accordance with the request of Pope Urban IV. in 1264, as so many others were in England; the second was the Gild of the town, and mixed up with the constitution of the borough.

The feast of the Body of Christ, kept on the Thursday following Trinity Sunday, was observed in England with great pomp. It soon became the principal time for the performance of mysteries and miracle plays. As may be seen at the present day on the Continent, every person, high or low, rich or poor, old or young, took his or her part in the great religious festival.

I think that the spectacle of the procession of Corpus Christi in Old Plymouth must have been a very interesting one. Many events have been more important, many in which graver issues were involved, but in this recurring festival all could join. It is difficult in this age perhaps to understand the good which, in a moral and social point of view, was bestowed upon this country by the religious pageant, and pious plays, and interludes of a by-gone epoch. Through such means, however, the working classes were not only furnished with a needful relaxation, but their very merry-makings instructed while they diverted them.*

The best way of ascertaining what the Gild of Corpus Christi in Plymouth was like will be to see what the rules of similar Gilds were elsewhere, and this is easily done by referring to the account of one of the most famous Gilds established for a purely religious object, that of Corpus Christi at York, which will be found in the late Mr. Toulmin Smith's "English Gilds."

In connection with the Gilds we often find the establishment of a "Church Ale." It must be recollected that in the times we are speaking of no tea or coffee was looked for to begin or end the day; the draught, morning, noon, and night, was beer; and in the fourteenth and fifteenth centuries an Ale meant malt liquor, of a better brew perhaps than could ordinarily be obtained, prepared by the churchwardens, and sold by them at a profit, the overplus being devoted to some charitable purpose in the parish, for the repair of the church, the obtaining of articles of church furniture, or for some similar purpose.† In fact, they were to our ancestors what fancy fairs, bazaars, and such like things are to us. There is no difference between the two; and therefore it was that in the year 1420 we find the Mayor of Plymouth and his brethren, the twelve and the twenty-four, agreeing that from thenceforth, for the honour

* Rock's "Church of our Fathers." † Roberts' "Social History."

of God and for increasing the benefits of the Church of St. Andrew at Plymouth, that on the feast of Corpus Christi every ward of the borough should from thenceforth make an Ale in the parish churchyard of St. Andrew, and that every person might bring with them such victuals as they pleased (bread and drink only excepted), and that friends and strangers were to be brought for the increasing of the Ale, and that for the weal of the said church none of the taverns in the town were to sell wine or ale upon peril of fine and loss of freedom. And then the entry in the Black-book of the Corporation goes on to say, that no person who shall go about with the shippe of Corpus Christi shall bring any one else to charge the Ale, and that there was to be no credit given:—"Item: That they make a reckoning to every person for mete and drink, and notte to pay at their leizure." Provisions follow for the entry of the receipts in the town's ledger, and that they were to be at the disposition of the mayor, the twelve and twenty-four, in every year. This Ale was continued for a long time, as I find another reference to it in 1488.

I do not quite understand the meaning of the *shippe* of Corpus Christi, but I am inclined to think that it means the fine piece of plate forming so important a feature upon the medieval dinner-table, the *nef*. It may be contended that the word is written in mistake for shrine, or it was the navicula or incense boat; but I do not think that either is so probable as my theory that it was the principal piece of plate of the Gild, and treasured accordingly, and special privileges given to the bearer in the procession which in past years had been abused.

In another entry in the Black-book will be found the record of certain privileges given by the mayor, recorder, and others to the Taylors' craft in 1479 or 1496, and one of the conditions is the payment of a yearly sum to the Gild of Corpus Christi.

These are the only two allusions to be met with in reference to this important Gild. Important it certainly was; for on the south side of Bedford Street we still find evidence of its former consequence, the houses there, including those of Messrs. Arnold and Matthews, standing on ground even now called Corpus Christi. This, I believe, marks the site of the Hall of the Gild.

But besides this, a portion of St. Andrew's Church was known by the name of Corpus Christi, and this probably was the part of the church which contained the altar of the Gild.

As I cannot connect the second Gild in any way with the church or parish, I must content myself now with briefly repeating what I have said elsewhere. The only entry relating to the Gild of Our Lady and St. George has caused many a reflection to be made on the ingratitude of the men of Plymouth. In 1472, 16th November, a bye-law was passed by the common council, that no man should be made free of the borough unless he was a whole or half-brother in Our Lady and St. George his Gild, and in pursuance of this, certain persons, who were before this free, but who were not of the Gild, were expelled from the corporation. In consequence of this, one *John* Yogge was expelled with the others; and it has always been assumed that this is the same Yogge who built the tower of St. Andrew, and the same who had previously filled four times the office of mayor. Now we know that Leland says *Thomas* Yogge built the tower, and added to the town; and the Black-book and other lists of mayors state that it was *William* who had been elected the chief officer so often, and that it was *John* Yogge who was cast of his freedom.

I am inclined to think that there were different persons; that from the name of the mayor being repeated four times as *William*, that he is correctly named; that from his occupying this position he is likely to have been the pious churchman who did so much for the sacred edifice; that Leland made a mistake in calling him Thomas, and that John Yogge was another person altogether who had been taking his place among his betters without lawful authority, and who was therefore righteously expelled.

I spoke just now of the Ale being held in the churchyard. Of course St. Andrew's churchyard at the present day would be the last place in which to hold a bazaar, fancy fair, or any festivity of the kind, and its narrow limits would prevent its being so used if it were wished. But in earlier times the yard was considerably larger than at present, extending much further south and east, and, I believe, also west. With the increase of the town, and the value of space round the market-place in the immediate neighbourhood of the church, land was sought after; and although we cannot suppose that it was unfenced before, we find in 1597 that the churchyard was more substantially enclosed. The map of Henry VIII.'s time shows a wall of some kind on the north side, but this is too much a

matter of detail to expect to find accurately represented in a drawing of this kind. About the same time the yard was fortified with barricades as part of a plan for the defence of the town, the gates being then made. The townsfolk were very satisfied with the provisions made for the reception of their adversaries, for the Black-book says :—"Had some four thousand men and some horse here, under the command of the Earl of Bath, to the great comfort and encouragement of the town and country, who (if it pleased God that the enemy should come) were there ready and willing to fight."

The next reference we have to the yard is in the memorable dispute between the vicar and the town in the mayoralty of Nicholas Sherwell. No doubt the vicar, who in 1637 was, you may recollect, Dr. Aaron Wilson, found that the erection of the new buildings of the Hospital of Poor's Portion was interfering with the yard, and one of his complaints was, that encroachments were being made "by the mayor and commonalty on the east side of the churchyard by building a row of shambles and other houses on parts of the churchyard, and on the west side by building of the hospital where the vicar had anciently a house."

For some reason or other the vicar waived this part of his complaint, and the matter dropped. In the same year a new wall and stile, between the tower and St. Katherine's Lane, now Catherine Street, was built at a cost of £17 16s. 11d.

In 1651 an old custom was revived of holding a market in the churchyard for the sale of yarn, the mayor and corporation ordering that "upon due consideration and for divers good reasons then alleged, as well as for the public good of the adjacent parts as for the benefit of this place, a yarn market should be kept within this borough in the churchyard, between the hours of ten and twelve in the forenoon, and so weekly on Thursdays thenceforward to continue. And all persons who are concerned therein may take notice that they may come and attend on the days and time, and at the place aforesaid, and then and there may sell wool yarn as formerly, and have the weighing of the yarn free for one year next ensuing."

This use of the churchyard for the purposes of a market was in direct contravention of the Act 13 Edward I., cap. 6, by which the king commanded and forbad, for the honour of the church, that from thenceforth neither fairs nor markets should be kept in

churchyards. But the men of Plymouth in 1651 were above the law, and conducted themselves accordingly.

In 1665–6, Peter Schagell and Gregory Martin were churchwardens, and for some reason or other it was thought necessary to do something to the fences of the yard. The whole yard was railed in and the palings coloured. The cost was defrayed partly from the ordinary income of the Church and partly from the contributions of the inhabitants. The list of the donors is entered in the book of accounts. The mayor, William Harper, heads the list with £2, and the amounts vary from this sum down to sixpence, fourpence, and threepence.

In 1691, more extensive works were carried out, and the churchwardens expended £21 10s. 9d. in the building of 293 perch of stone wall about the churchyard, and a pair of moorstone posts were purchased. In the accounts of the same year I find many entries of payments on account of gates, walls, and fences of the churchyard. For the first time I suspect the yard was enclosed with something more substantial than wood.

In the following year the work was not completed, for we find that Oliver Wrath was paid £45 6s. for moorstone for coping the walls, and the moorstone men had sixpence for drink.

It is evident that the area of the yard is very small in comparison with what it once was. The town authorities have never been able to leave it alone, but have been constantly encroaching upon it. The inhabitants were not slow to follow the example of their rulers, and, as I have before shown,* the southern side of Whimple Street, as well as the land on which the shambles were, have really been filched from the churchyard and thrown into the street, in consequence of stall-keepers and others having acquired a right by usage. In later times we all know what has happened. There is not much left on the north side now, and it may be safely predicted that in course of time the whole will be swept away and the Church (properly battlemented) fully exposed to view. We tread daily on the remains of those who have gone before, and in Plymouth God's-acre has become the busy street.

In 1656, the mayor and commonalty (so it is stated in the account-book) took of Mr. Robert Gubbes the elder a field lying to the southwards from Frankforte, for a term of 21 years, for the purposes of a new churchyard or burying-place, at the yearly rent

* "Ecclesiastical History of Old Plymouth."

of £3 10s. The necessary expense of fencing and making this field fit for the intended purpose was borne by the wardens. Stone, freight, carrying materials, brickwork, gates, labour, and so on, amounted to £105 3s. 4d.

The ground was laid out, and trees planted, but it was long before persons could be induced to bury their friends there. For a considerable period the receipts were very small, not covering the necessary outlay; and in 1681 there was an agreement with the authorities of Charles Church that they should share the annual loss. Many expedients were adopted to raise the necessary funds for keeping the place in order, and for the payment of the rent. George Berry, mason, paid 8s. for pitching stakes there, meaning, I suppose, depositing his scaffold-poles. Part was used for a rope-walk. It was let out for drying wool in; but I do not find, as in many country parishes, that anything was received for keeping sheep.

Apparently it was never a favourite place. In 1714 £2 4s. only was received, while in the churchyard about £30 was paid; in 1725, £1; and in 1732, £1 6s. 8d. Later on, in 1792, while £55 11s. 4d. was received on account of the yard, £2 0s. 10d. only came from the burying-ground (the rent alone being £2 13s.); and in 1823–24 the receipts were £16 18s. 6d., against £99 16s. in the yard. In 1811–12 the rent was raised to £10 per annum; and in 1822 it was resolved to purchase the land. This was done at a cost of £315, and the money repaid in two instalments. The first burial in this ground was that of Henry Walters, of the Hospital, and took place January 17th, 1657.

The parish registers commence in the year 1581, the first burial being registered May 14th, upwards of forty years after Cromwell's injunction of September, 1538, enjoining that every parson, vicar, or curate for every church should keep one book or register, wherein should be written the day and year of every wedding, christening, and burial, made, as it goes on to say, "within your parish for your time, and so every man succeeding you likewise; and also there insert every person's name that shall be so wedded, christened, and buried. And for the safe keeping of the same book, the parish shall be bound to provide of their common charges one sure coffer, with two locks and keys, whereof the one to remain with you, and the other with the wardens of every parish wherein the said book shall be laid up, which book ye shall every Sunday take forth, and

in the presence of the said wardens, or one of them, write and record in the same all the weddings, christenings, and burials made the whole week afore; and that done, to lay up the book in the said coffer as afore. And for every time that the same shall be omitted, the parties that shall be in the fault thereof shall forfeit to the said church 3s. 4d., to be employed on the reparation of the said church."

In all probability the registers of St. Andrew were commenced soon after the issuing of the injunction, for the St. Budeaux register begins in 1538. Any book claiming to be of earlier date cannot properly be called a register. Entries it may have relating to either births, deaths, or marriages, or perhaps to all; but it will not be found to be complete or kept with any definite purpose until this time. But there must have been talk of the matter before 1538, because the complaints of those who joined in the Pilgrimage of Grace in 1536 were, "that the king designed to get all the gold of England into his hands, under colour of recoining it; that he would seize all unmarked cattle, and all the ornaments of parish churches; and that they should be forced to pay for christenings, marriages, and burials." *

Sir Piers Edgcumbe, in this neighbourhood, was alarmed at the threatening state of affairs, and wrote thus to Cromwell:

"Sir Piers Eggecomb to Crumwell.

"Plesse it, ywr goode Lordeshyp, to be advertyssed, that the Kyngg's Majesty hast commandyd me, at my beynge in hye gracius presens, that in casse I parceyvyd any grugge or myscontentacyon amongge hys sojectes, I shulde ther off advertysse ywr Lordeshyp by my wrytynge. Hyt ys now comme to my knolegge this 20 daye of Apryll by a ryght trew honest man, a servant off myn, that ther is moche secrett and several communycacyons amongges the Kyngge's sojettes: and that off them in sundry places with in the Scheres off Cornwall and Devonsher, be in greate feer and mystrust, what the Kyngge's Hyghnes and hys Conseyll schulde meane, to geve in commaundement to the parsons and vycars off every parisse, that they schulde make a booke, and surely to be kept, wher in to be specyffyyd the namys off as many as be weddyd and the namys off them that be buryyed and off all those that be crystyned. Now ye may perceyve the myndes off many, what ys to be don, to avoyde ther unserteyn conjecturyes, and to continue

* Carte.

and stablysse ther hartes in trew naturell loff, accordynge ther dewties I referre to ywr wyssdom. Ther mystrust ys that somme charges, more than hast byn in tymys past, schall growe to theym by this occasyon off regesstrynge off thes thyngges; wher in, yff itt schall please the Kyngge's Majeste to put them yowte off dowte, in my poar mynde schall encresse moche harty loff. And I besseche our Lorde preserve you ever, to Hys pleasser, 20th daye off Apryll, 1536. Scrybelyed in hast. "P. EGGECOMB.

"To my Lorde Privy Seale ys goode Lordesshyp, be this gevyn."*

This reads very much as if Sir Piers himself was rather curious as to the proposals. The insurrection, however, delayed the enforcement of registration for a couple of years.

Our registers will not afford any information of general interest; but I may explain here, as I have often been asked to privately, two or three matters which are met with in every parish register. In the title-page to the third volume of the St. Andrew's Register we find the following:—

"According to an Act of Parliament, Aug. 24, 1653.

"Here followeth the Register of Publication Marriages, Births, and Burials, of Andrew's Parish, Plymouth, from the 29th of September, 1653. For the keeping of which book is appointed Henry Champlin, chosen by the parish, and approved by the Right Worshipful Richard Spurrell, Maior."

Appointments of this kind were made in every parish, in compliance with a direction of Parliament, by which registrars chosen by the parish, and approved of and sworn by a justice of the peace, should register births, marriages, and deaths; and that all persons wishing to be married should, twenty-one days before, deliver a notice to the registrars, to be published three Lord's-days then next following, at the close of the morning exercise, in the public meeting-place commonly called the church or chapel, or in the market-place on three market-days in three several weeks, and on the production of a certificate the parties might go before a magistrate; and no other marriage was to be valid within the Commonwealth. We find at Plympton St. Maurice the first marriage under this new regulation took place in November, 1653, the contract being published in the market-place. In the Plympton St. Maurice register, against the entry of the appointment of the registrar, are written

* State Papers, Bundle E; "Parish Reg. Abstract," vol. i. xxvii.

the words, "This is the hour and power of darkness." This arrangement lasted until the Restoration; but it was not found possible to insist on "no other marriage to be valid," &c.

Constantly found, from 1679, in registers against a burial entry, are the words, "Affidavit brought." These words refer to an act of parliament passed originally 18 Charles II., and made more stringent by 30 Charles II., chap. 3; entitled "An Act for Burying in Woollen," and intended "for the lessening of the importation of linen from beyond the seas, and the encouragement of the woollen and paper manufactures of this kingdom." The English woollen manufactures were of great importance, and much was done to promote them. The export not only of wool was illegal, but also of sheep and fuller's-earth; and these acts were intended to assist the trade. No one was to be buried in anything but woollen, and an affidavit that the deceased was not buried in linen was to be brought to the clergyman within eight days of the funeral. The fact of the affidavits having been brought in each case is entered with praiseworthy regularity in the registers for some time; but soon the information ceases.* The acts continued in force down to 1814, and were repealed by 54 George III., c., but not without opposition. Shortly before the repeal, a writer argued that in consequence of the dearness of paper, the prohibition to clothe the bodies of the dead in linen saved from untimely corruption in the grave, 200,000 lbs. of rags, which in due course then passed to the manufacturer of paper.†

Probably, even up to the middle of the seventeenth century, it was usual for the poorer people to be buried without a coffin. There are several entries in the registers much later stating so, and from the fact that in the churchwardens' accounts all the receipts for burials, both in the church and yard, are followed by the word "Chested," down to the time that the full lists cease to be given, the year ending Easter, 1663, I am inclined to think that the fashion had not long set in. In the decree made by the Star Chamber, settling the dispute between the vicar and the mayor and commonalty, a complaint was made by the vicar, that, contrary to the law and custom, the mayor and commonalty took from the vicar the fees for burial in the church and churchyard; namely, 6s. 8d. for every coffin interred in the churchyard, and £1 6s. 8d. for every coffin interred in the Church. After stating the complaint, the

* Burn's "Parish Registers." † William Taylor.

decree goes on, "for as much as it was on all sides confessed that the vicar hath now for every corpse buried in the church 1s. 4d., and the clerk 8d., and for every corpse buried in the churchyard 8d., and the clerk 4d., and for that it is alleged that the rates lay on such as are buried in coffins in the churchyard was by agreement of the parishioners, to prevent the great number of burials in coffins, which were found to be very inconvenient, and were agreed to be employed to the use of the church, their lordships thought fit that the s^d rates shall be settled by the bishop of the diocese for such as are buried in coffins, and shall be accordingly continued, but to be received by the churchwardens, who are to be accountable for the same, for the repairs and other uses of the church, and that the vicar and clerk shall enjoy their several rates for burials as aforesaid respectively."

From this it is evident that the burial in coffins was a comparatively new thing and regarded with disfavour by the church officers, who sought to restrain it by putting a higher fee upon such burials, which fees, or the greater part of them, were immediately claimed by the mayor and his brethren for the use of the church. The rights of the vicar were preserved by the payment to him of apparently the same fee as he would have received for an uncoffined corpse. The arrangement seems fair enough, for if the ground was occupied for a longer time, and so unusable, the parishioners would have to find new ground, as was the case in this parish, and the decree of the Star Chamber was just and equitable.

In the fourth volume of the registers is a note, that at the end are registered several French children and others not baptized according to the usage of the Church of England.

In 1687 is an entry, that Joseph Flin the child of James Flin of Ireland was baptized in the King's Catholick Chappell in the Citadel of Plym° by Xto Turner Cath. priest and his Ma^{ties} Chaplin there. Aug: 10 1687.

In the same volume is also the decree of the Star Chamber before referred to. This must have been considered of great importance, for not only is it set out in full here, but also at the beginning of the first volume of the churchwardens' accounts.

"Thomas Brockedon" puts his name in the first page of the first volume, adding the words, "His writtinge Anno Domini 1604," and his successor, not to be outdone, follows with, "March 25 day $come^d$ I to Plymouth—Philip Cory."

The fees for burials, as I said, were received by the churchwardens and applied to the use of the parish; and this continued down to the time of the closing of the yard, and indeed to the present time. This was, as Dr. Wilson thought, very unusual, but you will recollect the custom prevailed at St. Budeaux also. In 1635, the earliest time we can go back to, the charge for a grave for one adult in the yard was 6s. 8d., and for one in the church £1 6s. 8d. For a child the charge varied, being sometimes 3s., and going downwards, probably according to age, to 2s., 1s. 8d., and even so low as 1s. 6d. In this year there were 83 graves paid for. It is to be assumed that the other burials were uncoffined.

In 1638, there is the following: "Item received for a grave in the Church yard for a Dutchman coffined." All the others are described as chested. Was there any difference between a coffin and a chest?

In 1644, two hundred and ninety-one graves are entered, but many do not seem to have been paid for, and the sums received were smaller than usual; 1s. 8d. and 1s. were often paid.

I quote some special entries:—

1643-44. *Item pd. for making* 29 *graves in October and* 22 *November for souldiers then slaine*, xxv*s.* vj*d.*
Pd. for 34 *graves for slaine souldiers and poor folkes*, xvij*s.*
Pd. for 21 *graves for souldiers and poor folkes*, x*s.* vj*d.*
Pd. for making 14 *graves*, vij*s.*
Pd. for making 18 *graves for souldiers, poor folk, and cavallards*, ix*s.*

And later in the year 8s. for sixteen graves for soldiers, poor folk, and cavallards. These entries tell the story of the various skirmishes around the town in this year. In the following year the number of graves entered are no less than three hundred and seventy-three. Two hundred and eighty-four soldiers' graves were paid for in this year. In 1645–46 are the last entries for soldiers' graves. Sixty-two payments appear to have been made. The number of other graves (bodies chested) fell to one hundred and eleven; but all were not paid for, and the amounts for many were small.

One or two inscriptions from stones in the yard may be quoted.

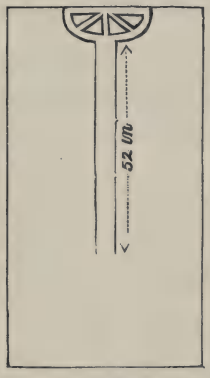
"To Eliza Priest Stone, aged 41,—
While we this tribute to her ashes pay,
And mourn her loss, we can with pleasure say,
That she was mild and amiable through life,
A tender mother and a faithful wife."

Another, on a child who was killed by a horse,—

"My parents dear, weep not for me, I pray,
The thing by which I caught my death, I met upon the Quay."

"Here lyeth the body of Thomas Neat, of Ride, in the Isle of Wight, who departed this life 27th May, A.D. 1674.

"Here lyeth him who once did bear
Command of men and ships who were
His own, besides a merchant too.
Yet this and all would nothing doe
To keepe from death when Christ doth call
To come to him that made us all.
But he we hope with Christ doth rest,
With whom it's best for all to rest."



In the yard is the tomb of James Devoit, who left France in 1685, and was for thirty-two years minister of the French Reformed Church here and at Stonehouse. He died in 1723, aged 65.

The stone, of which I give an engraving (copied from a rough sketch), is, or was until lately, in the North-yard, and appears to be a very early Christian memorial.

A very gloomy entry in 1661 is as follows: "Item: Paid for a shrowde for the old Cruble, 2s. 6d." Why the remains of this old gentleman should receive such attention does not appear. There is no similar entry, and with it we may quit this somewhat melancholy part of my subject.

And now to come to the Church. Excepting the tower, there is nothing imposing or attractive on the outside. Perhaps the best view is from the bottom of St. Andrew's Place, where the south transept, the ivy-covered roof-loft staircase turret, and the south porch, added to the effect gained by the proximity of the abbey, form a somewhat pleasing picture. But the east end, with its long flat front and mean doorway, and the north aisle, the recent additions to the transept of which have not much improved matters, are poor in the extreme. But the interior is, in my opinion, a noble one; at least it ought to be so. It is a fine specimen of a Devonshire Perpendicular church. Now that the forest planted within its area

nearly fifty years ago is being cleared away, its proportions are being revealed, and its appearance as left by its architect may to some extent be imagined. But in saying this I would not wish to be understood to say that it is fine or noble in the sense in which so many of our churches are, but simply as a building of its time.

It is said that no part of the Church is older than 1430, but the greater part of it to all appearance is much later than this. But we shall see as we go on how much the edifice has been pulled about. We have no information or evidence whatever to guide us in our attempt to ascertain the character of any earlier building, with one exception, of which I shall presently speak.

As mentioned in a former paper, the earliest reference we have to anything pertaining to the fabric of St. Andrew is in 1385, when it is stated that a south aisle was added to the Church, dedicated to the Blessed Virgin. Nothing of this presumably remains; but in 1440 we find an altar of the Blessed Virgin still in the Church, and in the following year the north aisle is said to have been built. In 1488 we have accounts of moneys given towards the south aisle of the Church, and reference is also made to St. John's aisle, and the aisle of Corpus Christi. Between 1440 and 1460 the north chapel and the tower were built, and we may conclude that by 1490 the building, much as we now have it, was completed. But could we go back four hundred years, how different should we find the Church, and much more like a place of worship than we have hitherto known it. Happily it is resuming now to a great extent its former aspect. I may say, however, that two things are wanting to bring the edifice more nearly approaching its original condition.

The first is to take away every bit of plaster from between the braces of the roofs throughout the Church. I believe I am right in saying, and the inspection of every Devonshire church more and more confirms me in my opinion, that these spaces were never originally plastered. While Perpendicular work debased almost everything else, it brought wood-work, and especially the wooden roof, to perfection; and I will never believe that such a roof as that of St. Andrew was intended to be plastered over as soon as completed.

The other want is, the glory of the Devonshire church, the high richly-carved screen and roof loft, or, if we cannot have the latter, the screen alone. Without this the Church can never be complete, or present a satisfactory appearance, for the simple reason that the

building was designed with one. While in other places the architect strove to give dignity and importance to the east end, by raising the chancel and making the altar conspicuous, in Devonshire he kept both low, frequently on a level with the nave, and generally but one step above it, but expended all the taste and skill of which he was possessed upon the chancel screen and the parcloses. Until St. Andrew's again possesses a screen in the place of the one so barbarously destroyed in 1826, it cannot be considered as properly restored.

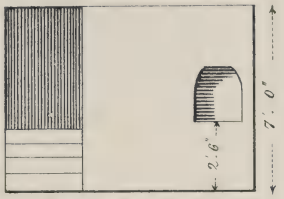
Before going further, I have to refer to two or three matters which connect the Church with the earlier building. During the destruction in 1825–26 several coins were found within the church; one of these was of the date of Edward I.

In October, 1841, while making preparation for the new reredos, and for vaults, a small crypt was discovered below the altar, the entrance to which was on the north side in the floor. It was about 19 feet long, 9½ feet broad, and 7 feet high. There must have been about twelve or thirteen steps from the floor of the church to the floor of the crypt, but the greater part of them were gone. At the bottom of the steps a wall had been built up to prevent further access. The interior was filled with human bones, which, it is conjectured, were collected and placed there in 1826. On the east was a grating to give light, which had been blocked up; the opening had formerly an elliptic arch on the outside, on the inside the wall was supported by a lintel. In the north wall, 2 feet 6 inches above the floor, was a niche, 1 foot 8 inches broad, by 1 foot 2 inches deep, and 2 feet high. In the west wall were two other niches, one, the northernmost, was about the same size as that in the north wall, but 3 feet from the floor; the other, 3 feet 2 inches from the floor, and about the same size, but of a rather different shape. These two niches have the appearance of Early English work, but I cannot vouch for the accuracy of the detail. The illustration is copied from a sketch made at the time of the discovery. The crypt was entirely destroyed in making vaults in its neighbourhood. It is impossible, without information which is not attainable now, to speak with certainty as to this most interesting little chamber. It seems to indicate a structure of very much greater antiquity than anything else we have in the Church. In all probability it was either the treasury of the Church or a place for depositing relics. As far as I can make out there is some-

PLAN AND INTERNAL ELEVATIONS OF

CRYPT

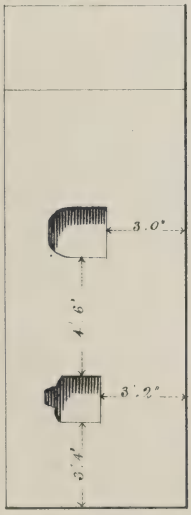
St. Andrew's Church, Plymouth



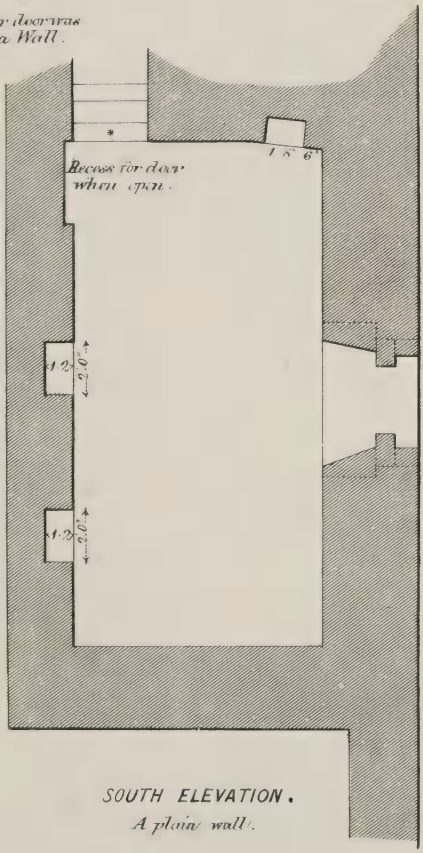
Steps leading to floor of Church greater number of which were removed.

NORTH ELEVATION.

* This opening for door was blocked up by a Wall.



ELEVATION.
Looking West.



SOUTH ELEVATION.
A plain wall.

ELEVATION
Looking East

SCALE

5 10 20 30

SEPULCHRAL EFFIGIES.

thing similar at Beverley, and there is in it some resemblance to the famous crypt of St. Wilfrid at Ripon.

Another most interesting discovery is that of the two sepulchral effigies recently found in the church. The largest is a stone of Purbeck, 7 ft. 3 in. long, by 1 ft. 10½ in. broad. It was found in May last, face downwards, in the south chapel, and evidently so placed at the last destruction, in 1826, as something to be got rid of as quickly as possible. Why it was not broken up as well as its companion, it is difficult to say. There is a tradition that there were twelve figures in the church similar to these, and although the suggestion has been ridiculed, I am not at all disinclined to believe that it may be true. We have in this county many sepulchral effigies of considerable value to the artist, the architect, and the antiquary. They are frequently found in country churches, and range from the thirteenth century to the sixteenth. The two fine figures in their original positions in the church of Plympton St. Mary are well known, as well as those of Sir Ralph Gorges and his lady at Tamerton Foliott. We have no clue whatever as to who are represented by these figures, and any attempt to give them names would be but the purest speculation. But the interest is not diminished on this account, and I consider that their discovery is the most valuable ever made in St. Andrew's Church. They should be carefully preserved, and placed in a conspicuous situation; poor and disfigured as they are, they will be examined with a care which will not be devoted to the present restoration, the new carving, or to any other part of the church. Whether the two are to be considered as connected in any way, I am unable to say. They were found close together, and the presumption therefore is that they were removed from adjoining spots. Their age is about the same, apparently late in the thirteenth century. The larger and more perfect slab is of course the figure of a woman. The smaller is a male figure. Doubtless these effigies, with others that have perished, and much besides, had a place of honour in the completed church of 1490.

For more than a hundred and thirty years after its presumed completion we have little or no information as to the state of the church.

In 1553, the King's Commissioners were here. In spite of plunder in every direction, the royal revenues were lessening, and the Government was in debt to the extent of £250,000.*

* Collier, 5.

Northumberland, following the steps of his father, who filled the treasury of Henry VII., and brought his own head to the block, set himself to the work with heart and good-will. No less than nine commissions were appointed with this one object, four of which were to go over the often trodden ground and glean the last spoils which could be gathered from the churches.* Hear what even such a writer as Mr. Froude says with reference to these commissions: "For the business of plunder the rapacity of the Crown officials had been distanced hitherto by private speculation. The halls of country houses were hung with altar cloths, tables and beds were quilted with copes, the knights and squires drank their claret out of chalices, and watered their horses in marble coffins. Pious clergy, gentlemen, or churchwardens had in many places secreted plate, images, or candlesticks, which force might bring to light. Bells, rich in silver, still hung silent in remote church towers, or were buried in the vaults. Organs still pealed through the aisles in notes unsuited to a regenerate worship, and damask napkins, rich robes, consecrated banners, pious offerings of men of another faith, remained in the chests in the vestries. All these were valuable, and might be secured, and the Protestants could be persuaded into applause at the spoiling of the house of Baal. Ridley in London lent his hand. On the 4th of September the organ at St. Paul's was silenced preparatory to removal. On the 25th October was the plucking down of all the altars and chapels in Paul's Church, with all the tombs, at the commandment of the bishop, and all the goodly stone-work that stood behind the high altar. The monument of John of Gaunt himself would have gone down had not the council stepped in to save it. Vestments, copes, plate, even coin in the poor-boxes, were taken from the churches in the city. Some few peals of bells were spared for a time, but only under conditions of silence. A sweep as complete cleared the parish churches throughout the country. There was one special commission for bells, vestments, and ornaments; two for plate and jewels; a fourth to search private houses for church property, and, should any such be found, to make a further profit by fine of the offenders."† These commissions were represented to the king "as an inoffensive expedient, and only calling for the superfluous plate and other goods that lay in churches, more for pomp than use." Nothing was to be left but one chalice; everything else

* Froude. † Froude, "History of England," vol. v.

was needless. "But," to quote the words of Collier, "those who called these things superfluous, and showed so slender a regard for the honour of religion, were none of the best reformers. Had these people governed in the minority of Josiah, as they did in this of Edward VI., they would in all likelihood have retrenched the expense of the Mosaic institution, and served God at a more frugal rate. They would have disfurnished the temple of most of the gold plate, carried off the unnecessary magnificence, and left but little plunder for Nebuchadnezzar."

I found in the State Paper Office, a few months ago, the certificates of the commissioners for this county, or such parts of them as remain, entitled, "The certificate of all jewells, plate, and vestments of all churches and chapels within the said county, taken and made by Sir Peter Carewe, Knight; Sir Gawen Carewe, Knight; Anthony Harvey, Esq., and Thomas Hatch, Esq., by virtue of the King's Majesty's Commission to them directed, bearing date the 3rd day of March, in the vii. year of the reign of our Sovereign Lord Edward the Sixth by the grace of God of England, France, and Ireland, King Defender of the Faith, &c. The value of all such jewells and bells that were taken away and also sold by the parishioners within certain parishes in the s^{d} county, and recovered by the s^{d} Commissioners by virtue of the King's Commission before this tyme to them directed, and specified in the last certificate, as hereafter followeth." Although with reference to other parishes there is a good deal of information, as to Plymouth this document is provokingly curtailed. No reference to the bells, to vestments, or plate, or jewels, but simply a statement of the fact that there had been committed to the custody of William Symons and other the parishioners there, by indenture, one chalice. The parish of Budock is mentioned, three bells in the tower and one chalice, being left in the custody of John Ernesettle, Leonard Worth, and other the parishioners there. Had St. Andrew's lost everything before? I expect so. The church of the White Friars had not. We have an inventory of what was left there; and the Commissioners seem to have received for vestments £176 2s. 8d., and for candlesticks and crosses of latten, sold to divers parishioners, £9 10s. 10d.

Another long interval, broken only by the slight glimpse given us by Leland, and we find ourselves on sure ground, and with certain information, in the year 1635. At this time the churchwardens'

accounts begin, and from them we shall be able to trace the vicissitudes of the old Church down to the present time.

Among the annual receipts each year a considerable space is occupied by the moneys received on account of pews. In the earliest account, we find the plan adopted for two centuries after in full force. The system was to sell the right of sitting in a seat for a life or lives, but I am unable to ascertain with certainty the amount charged. I am inclined to think from the variety in the entries, that the price varied with the situation and the age of the person to be accommodated. I will give a few entries relating to the pews.

The receipts for men's pews (for I should say that the moneys for men's and women's are entered separately, and that the sexes appear to have been separated, sitting in different parts of the church), amounted in 1635–36 to £13 9s. 8d., and for women's to £21 2s. 4d.

Item: Received of Thomas Bootye, smith, for a pewe in the south ile, wherein Buller sate, who died out of the almshouse, xs.

Item: Received of James Baker for Nicholas Horrell's pewe, in the second rank in the south ile, xs.

Item: Received of Richard Harell for a pewe in the south alleye, where Fynch, the measurer setts, xs.

Item: Received of Humfry Smyth for Edward Champernowne's seate, under the gallery, viijs.

Item: Received of Samuel Bulteel for his seate in the chancel, where Mr. Worth setts, xxxs.

Item: Received of William Hobbes for a seate in the gallery, where Martyn Coombes sate, vjs. viij*d.*

Item: Received of Thomas Paddon for exchange of his pew for his father's, Nicholas Paddon's seate, vjs. viij*d.*

Item: Received of Arthur Roe for removing him from the seate where Edward Caunter sits into the formost eastern seate in the gallery, xs.

Then they sold Arthur Roe's seate.

Received of John Prance for his setting in the seate where Arthur Roe sate, xiijs. iv*d.*

On the other side there are constant charges for wainscott, deales, boards, hinges, nails, and so on, on account of repairs and erection of pewes. In 1639 Mr. Wilson's pew was fitted, Thomas Truebody being paid 12s. 11d. for doing it. In 1650 Mr. Hughes' seat cost 2s. 6d. mending; but it was badly done, or quickly got out of order again, for the following year 4s. 2d. more had to be spent

upon it. In 1652 twelve yards of green double baize were purchased for £1 7s. for lining Major-Gen. Desborough's wife's pew. The general's pew took only 10½ yards, and cost but 17s. 6d. In 1653 two new pews were built in the chancel; and in the same year are several entries for work done to pews, for locks, keys, cramps, &c. Among other items charged are for four locks and sixteen keys for the mistresses' pew doors, the mistresses being, as far as I can understand, the wives of the aldermen. These mistresses' seats were behind the seats of the mayor and corporation. Query, was it in one of these seats that the altercation took place between my Lady Hawkins and Mrs. Downman, her former servant, the wife of the mayor, which ended in her ladyship boxing the ears of the lady mayoress, an insult to the town which Sir Richard was obliged to compromise by the gift of a house?

For a sitting in the new pew in the chancel I find £3 charged the following year; and Mr. Hughes, probably moved with envy at the appearance of the pews of the Major-General and his wife, had his seat covered also with baize. Five new pews in 1658 were erected in the gallery, and the following year four more in the south aisle. In 1661 and the following year many new seats were constructed, and there was constant dealing, chopping and changing, with regard to the pews generally. In 1672, £1 5s. 10d. was paid to William Boone for removing and making up the midwives' seats near the font. We shall hear more about seats of this kind by and by.

In 1679 is a very particular entry: "Received of Thomas Spencer, doctor of physick, seven pounds in money, for the sitting of himself, Sarah his wife, and their ten children; viz., Sarah, Bridgett, Rachell, Penelopy, Ann, Jane, Ulalia, Thomas, Samuel, and Henry, in a Seat in the Chancel in St. Andrew's Church, in Plymouth, by him at his own cost erected and finished, with the approbation and consent of the Maior of this borough and the Churchwardens of the said parish, into which seat, during the lives of the said Doctor and his wife, or either of them, nor as long as five of his said children shall be living, no other person or persons are or is to be placed."

Dr. Durston also paid 5s. for adding a foot breadth to his seat; and similar entries to these often occur. In 1682, paid Mr. Moore, the upholsterer, for new lining and fitting the midwife's seat, at the request of the vicar, Mr. John Gilbert, £1 10s.

I think I have said enough to show the working of this system of pew dealing; it continued until the year 1818. In 1817, in consequence of difficulties arising with reference to money matters, the Church having been much neglected and out of repair, a committee was appointed, and a report was made, the result of which was that the vicar and churchwardens, with the consent of the vestry and the bishop, substituted for the illegal selling of seats for lives the equally illegal system which still prevails (or I should say did prevail; I hope it will not be again commenced when the church is re-opened) of letting pews at an annual rental to parishioners and non-parishioners, irrespective of the legal rights, not to say fair claims, of the former.

In 1636, when the differences arose between Dr. Wilson and the mayor and commonalty, the vicar complained that the mayor was in the habit of selling the seats in the Church, and that he occupied the chancel, setting up seats there, letting some and giving away others, and among them the vicar's seat, and selling the rest, and taking moneys for burials therein; *i.e.* in the chancel. The court ordered as follows: "As touching the pewes in the church, which is alleged are sold by the mayor to such as will give most, taking 50s. and £3 and more for one roome in the seat, it is ordered that the disposall of the said pewes is to remain in the vicar and churchwardens, and if they cannot agree, then the Bishop of the Diocese, or his chancellor, is to determine and order the same, according to the ecclesiasticall law; and their lordships farther think fitt that there be no seat hereafter appropriate to any house or family, yet that no seats be altered that are now settled; but as they shall become void, to be disposed of according to the former order, and that therein care be had to prefer the ablest inhabitants and householders, and that the revenues and profits thereof be to the repairs and other uses of the church, which the churchwardens and their successors are to receive and be made accountable for, and in such manner as they are for other money received by them for the use of the church. And as touching the pewes belonging to the mayor, magistrates, common councell, and publick officers, and their wives, that these be, from time to time, continued as they are now, without any alteration. Whereas it is farther alleged by the said vicar that the mayor claimeth the right of the chancell, setts up seats therein, giveth away others (and among them the vicar's seat), selleth the rest, and taketh duties for

buryalls there. The mayor and commonalty confess that they claim the same under the impropriator, and do employ the benefit thereof to and for the use of the church; and in regard thereof are at the charge of reparation of the said chancell, and if there be any surplus of benefit they employ it to the use of the church, upon which consideration their lordships think fitt that the said mayor and commonalty shall enjoy the same accordingly. And as concerning the seats in the chancel belonging to Mr. Hele and his wife, the same are to be restored to them, and another convenient seat to be erected in the chancel for the vicar at the charge of the parish, and the vicar's wife is to be seated in the seat next to the mayor's wife, being the ancient seat appertaining to the wife of the vicar of that church."

The governor of the town and his lady always had a seat in a prominent part of the Church, and we often find the cushions belonging to it referred to in the inventories. In 1689, with a black velvet cushion with gold and silver fringe for the mayor, are also mentioned two flowered silk cushions and one black plush cushion with gold and silver fringe for the governor and his lady, and these were in the custody of the churchwardens until they seem quietly to have appropriated them for the use of the Church, and turned them into those monstrosities—cushions for the altar. In 1835 the churchwardens thought the seat might be used by the parishioners, and a letter was written by them to the then governor, Lord Hill, informing him that it was intended, in consequence of the great demand for sittings, to appropriate the seat hitherto set aside for the governor of the town, by courtesy, to parishioners. Lord Hill replied that it was not his intention to give up the seat appropriated for upwards of two hundred years to the governor; and that he had instructed Major-General Sir Willoughby Cotton, then in garrison, not to relinquish the right to the seat; and following this letter was one from Sir Willoughby Cotton, informing the churchwardens that it was his intention to attend St. Andrew's on the following Sunday morning, with the officers of the staff, and occupy the governor's seat. A conflict in the Church on a Sunday morning between the Major-General and his staff, and the churchwardens and their staff, was clearly a thing to be avoided, and an interview took place, at which it was arranged that the proposed military descent should be postponed until Lord Hill had been again communicated with.

The result was that Lord Hill agreed that the matter should be referred to the bishop; but at the same time stated that he had no intention whatever of being bound by the decision of the bishop. Several letters followed, and at last a case was submitted to the Bishop, the late Dr. Phillpotts. His decision was that the claim of right set up by the governor could not be sustained in a parish church, but that, as the governor or his delegate represented the Crown, he must be considered as a principal inhabitant and parishioner, and that the churchwardens consequently ought to assign a seat in the parish to him as such. The whole matter dropped, and I do not know that a seat was so assigned. The letter of the bishop is a most masterly one.

From the well-kept volumes of accounts we are able to ascertain what additions, alterations, and repairs were made from time to time, and I will refer to the most important of them, omitting all reference to the erection and repairs of pews previously alluded to, and which occur in perhaps every page of the disbursements.

In 1635–36, Preserved Deverall was paid £8 5s. 8d. for making carved work and pillars for the enclosing of the communion-table; and sawing wainscott for the pillars cost 7s. 6d.; and Amos Anderton had 12s. 4d. for ironwork done about the Ten Commandments.

In 1635 there are many charges relating to the roof of the Church, indicating that it had been new slated; and we may presume that the winter was a severe one, as there is a payment for removing snow and ice from the leads in December.

In 1640–41 there are charges in connection with the font.

In 1643–44 the Church was whitened, and this, with repairs to the roof, cost £16 7s. 6d.

In 1644 and following years, the chancel and the north and south and chancel aisles were raised, but there is nothing to show to what extent this was done, or what the former levels were. Raising the south aisle cost in stone, earth, and workmen's wages, in 1644, £13 12s. 9d.

Charges for whiting or white liming the Church constantly occur, as well as for cleansing the church after the white limers.

The tower door was walled up in 1661, and re-opened in 1785.

In 1662 a font was placed in the Church. We do not know when the old one was removed, or what became of it, but we have

an entry for its repair. I suspect it was cast forth before 1646, for in that year I find the charge, "P^d for a bason for the baptizing of children, 4s. 6d." The one placed in 1662 is, I believe, without doubt the one now in the Church. We have the items of its cost, and as I am afraid we have seen the last of it to make way for a bran spic and span new one, it may be worth while to give the particulars :—

William Houghton, for making the font and other charges, viij*l.* v*s.* vj*d.*
Matthew Glanville, mason, work on the font, ix*s.* iv*d.*
Pd. to eight porters, for carrying of the font to the church, iij*s.*
Pd. Will Gayre, for moor stone and wood about the font, vij*l.* xviij*s.*
Pd. Richard Featherstone, the joiner, for a cover to the font, viij*s.*
Pd. John Hall, for a pipe of lead to the font, iij*s.*

The total cost was £17 6s. 10d.

It is of black marble. Up to the time of the destruction in 1826, it was rough, but Mr. Foulston thought he could improve it, and had it cut and polished. It was formerly raised upon two courses of granite, forming steps, and had a wooden cover, as above mentioned, with hinges secured by a lock. I am sorry that this font, two hundred and ten years old, is to be discarded for one supposed to be more in accord with the rest of the building. Historically, it is a link, having been placed in the Church by Dr. Ashton, immediately after the ejection of Mr. Hughes. It ought not to be lightly thrown on one side or discarded in the way proposed, as no new font can possibly have the interest of the old one.

Surplices seem to be dear. The same year that the font was set up, two new surplices were bought at Exeter, and cost £5 14s.

The year before, the king's arms were painted as well as the arms of the town, and put up in the church.

In 1665 the following entries occur :

Paid to the colouring the ballisters in the vestry and the communion-table, and flourishing the town arms behind the mayor, and gave them in beer at the making of the rails, xxi*s.*
Paid for a stamp for the tokens, and for tokens to John Hall, xiv*s.* ix*d.*

The Church was white limed twice this year, at a cost of £5 14s. 2d.

In 1667 £12 was paid to John Chace for pointing the church all over; and in 1674 it was again pointed, the cost then being £13 12s. 6d.

In 1675, *for new painting and fitting the king's arms, and cleansing and washing the Commandments, and for setting them up again, and to the ringers when we thought the king was coming,* xiv*s.* viij*d.*

1682-83. *Paid Mr. Philip Pearse for drawing the picture of King Charles I., which by consent of the bishop was set up this yeare in memory of his sacred name, whoe dyed a martyr for the Church of England by the bloody and barbarous rebells and sectaryes,* 1648, *vl.*

Paid him for priming and twice painting the gallery, for drawing the arms of the king, town, and diocese thereon, with inscriptions on it and the wall, for mending the old king's arms, painting a chest, and divers pinns in ye church, viij*l.* *vs.*

Paid postige from the Navy Office, and expences with workmen, and going to Mount Edgcumb about the king's picture, *xs.*

In 1690 the affairs of the church had apparently become desperate; and a letter was written, so states the book, "by the Right Worshipful Phillip Andrew, merchant, at the desire of and with the full approbation of the aldermen and common councilmen of the burrough, to the Hon. Sir John Maynard, Knight, acquainting him thereby that the Church of St. Andrew, within the burrough, was gone very much in repair and decay, and that the income of the church would not repair the same, and that the inhabitants were not well able to raise soe great a sume as was necessary for repairing thereof; and withal recommended the same to his charitable consideration, and particularly with respect to money raised out of the estate of Ellis Hele, Esq., which was in the disposition of the said Sir John Maynard for charitable uses."

And that in answer to the said letter, "the said Sir John Maynard sent a letter to Mr. Nicholas Carkeet, of this towne, merchant, one of the trustees for the said trust, bearing date the 26th day of April, 1690, in these words; viz.,

"Cousin Carkeet,—I have received information under several hands that the Old Church, in Plymouth, wanteth much repairing, and that the inhabitants are not well able to raise so great a sume as will be necessary for the doing of it; therefore I doe desire and appoint that yourself and the other trustees of Hele's charity would pay out of the money in the chest at my dispose towards the repairing of the Old Church the sum of £150, not doubting but that some of you will take the trouble and care to see that the money be layed out and employed to the best advantage for the repairations of the Old Church only.

My service to Mr. Mayor and his brethren, yourself, &c., and rest, Your loving kinsman and friend,

Jo. Maynard."

26th April, 1690.

According to the direction contained in this letter, the trustees took £150 out of the iron box, and paid it over to Thomas Ridler, one of the churchwardens, and £151 6s. 6d. was expended by him about the Church, the principal amounts being laid out upon the roofs, leads, and windows.

In 1703 there was a great storm, being the one in which Winstanley and his lighthouse perished. Much damage was done to the Church, and for the first time in the history of the parish, as far as I can ascertain, a church-rate was levied. The roofs appear to have been much injured, as the churchwardens bought boards and borrowed sails to protect the building. In 1716–17 another storm did much damage, but the cost of the necessary repairs was raised by voluntary subscription.

In 1733–34, £54 18s. 6d. was collected from the parishioners for "plaistering the middle aisle," but, according to the list of payments, this cost only £15 12s.; but there are other charges for carpentering and timber, amounting to £62 6s. 8d.; so that something more than the mere plastering must be intended. Fourteen shillings were paid for 2,000 Cann Quarry slates.

In 1753–4 the tower was new roofed, the work costing £74 17s. 11d., £48 3s. 7d. of which was raised by subscription of the inhabitants. The battlements of the east and west sides appear for some reason or other to have been built up; they were now opened, and the whole tower pointed from top to bottom. There are many entries with respect to the tower and sun-dials about the church. In 1638 the dials were new fitted, painted, and gilded, at an expenditure of £1 2s. 2d. There seem to have been three sun-dials—one over the east door, one over the south porch, and one somewhere about the tower. The cock on the pinnacle was often troublesome, and had to be taken down, the process costing sometimes 1s. 6d., sometimes more. In 1699 a new one was provided, which was painted and gilded by Philip Pearse (who seems to have been the skilled man of the day in Plymouth), he receiving £1 5s. for this part of the work, Mr. Cockey £2 10s. for the animal itself, and "P^{d} to the man that put up the cock for beer, 6d." The old cock was sold at the same time for 6s. 6d. In 1704 the bird was down again, and £2 10s. spent upon him. In 1737–38, "P^{d} Mr. John Bussey's note for taking down, repairing, and putting up the cock, and all the vanes on the Tower, and so on, £5 10s.; and p^{d} John Hellier for gilding the three vanes, £3." In the next year's accounts

there is another charge for repairs to the south-east pinnacle, and placing the vane thereon, £2 12s. 6d, and in 1782 a new set of vanes were put up, costing £23 10s. 10d.

It has been always stated that the clock in the tower was made and first put up in 1706; but I find there was a clock there long before. In 1640, 2s. 6d. is charged for amending the clock, and in 1695 the churchwardens called in one Mr. Harvey, who gave his advice about the old clock, and they charge 2s. as having been spent on him. The clock, the present one, made by Thomas Mudge, was very probably the gift of Colonel Jory, who did so much in other ways for the town. It must have been given by some one, for I find no reference whatever to it in the books of account.

Passing from the tower to the bells, the first notice we have of them is in 1594, when the Black-book tells us that "the cage of bells were cast for Plymouth Church, consisting of five." It is scarcely possible to suppose that Yogge's "steeple" remained thus unfurnished for more than a century, and yet I believe such to have been the fact, for in the certificate of the commissioners of 1553, to which I referred just now, there is no reference whatever to bells, while in the inventory of every other church in the Deanery and hundred, the bells are particularly mentioned and their number specified. In 1631 the peal was recast, and in 1709 Colonel Jory presented the Church with a peal of six new bells. In 1733 there is a charge, "P^{d} Mr. John Pennington for casting the fifth bell, as per agreement, £41 16s." Towards the cost of this bell, £54 18s. 6d. was collected from the parishioners.* I cannot explain this; re-casting a bell ought not to have cost this sum. Colonel Jory's peal was a heavy one, and in 1749, in consequence of the tenor having been cracked, it was cast into a peal of eight, the cost being defrayed by voluntary contributions. Of these bells the seventh and tenor fell while in full-swing in 1752, doing a great deal of damage to the belfry and Church, falling through all the floors of the tower. I do not find that any of the ringers were injured; but the necessary repairs amounted to a considerable sum. With the exception of the tenor and the new first and second, the bells now in the tower are those cast in 1749 by Thomas Bilbie, and his name or initials are on all except the fifth. The sixth and seventh give us the information:—

* Brindley.

"Thomas Bilbie cast us all,
Thomas Bilbie cast all wee."

Bilbie's tenor cracked in December, 1839, and was re-cast by Mears in 1840.

Some of the entries relating to the bells and their ringing are interesting. The moneys received for ringing were always taken possession of by the churchwardens and entered in their accounts yearly, the ringers being paid for certain days. Seven shillings and eight pence only was received for the year ending Easter 1636.

1639-40. *Pd. ringers for ringing in remembrance of God's gracious deliverance of this land from the Spanish Invasion, and for candles*, vs. iij*d.*

For ringing when the news came of a triennial parliament, vs.

1641-42. *For the ringing at the rejoicing for the pacification between England and Scotland*, vj*s.*

Item paid for beere for the ringers Sunday before St. James' day, 1642-43, ij*s.*

1643. *Pd. ringers for Hopton's overthrowe*, 10*th April*, vj*s.* viij*d.*

3*rd October, in memorial of the Sabbath-day fight*, vs. viij*d.*

1662. *Ringing at the coming of the Earl of Bath*, vj*s.* viij*d.*

1685. *Pd. the ringers on the news of King Charles II. recovering*, xv*s.*

But they had xx*s.* when James was proclaimed, and on his being proclaimed a second time, xiiij*s.* more.

1689. *Pd. for ringing* 9*th Aug. at the news of Kirk's relieving Londonderry*, j*l.* viij*s.*

1690. *Pd. for ringing, when the news came of the defeat of the Irish army, by the mayor's order*, xs.*; and Pd. likewise when it was confirmed*, xv*s.*

What would have happened had it not been confirmed?

1693. *Pd. for ringing three days at the Bishop's triennial visitation*, ij*l.* x*s.*

The Sabbath-day's fight soon dropped out of mind; but down to 1820, the days observed by the ringers and paid for by the parish, were the following :—

		£	s.	d.
May 29.	King Charles' Restoration . . .	0	10	0
July 24.	Deliverance from Spanish Invasion . .	0	10	0
Nov. 4.	King William's Arrival . . .	2	0	0
	(This seems extravagant.)			
5.	Gunpowder Plot	1	0	0
17.	Queen Elizabeth's Accession . . .	0	5	0
30.	St. Andrew's Day	0	5	0
Dec. 31.	Ringing out the Old Year . . .	0	10	0
Jan. 1.	Ringing in New Year . . .	1	0	0
	Ringing at choice of Churchwardens . .	1	0	0

The Corporation paid for ringing on the anniversaries of the King's Birth, Accession, and Coronation.

There are rhymes in the belfry similar to those found in many other places, but all seem to vary a little. These are more musical than some ;—

"Nos Resonare Jubent Pietas Mors Atque Voluptas."

Let awful silence first proclaimed be,
And praise unto the Holy Trinity;
Then honour give unto our noble King,
So with a blessing let us raise the ring.
Hark! how the chirping *Treble* sings most clear,
And covering Tom comes rowling in the rear
And now the bells are up, come, let us see
What laws are best to keep Sobriety,
Then all agree to make this their decree:
Who swears or curses, or in choleric mood
Quarrels or strikes, although he draw no blood;
Who wears his hat or spur, or overturns a bell,
Or by unskilful handling mars a peal,
Let him pay sixpence for each single crime;
'Twill make him cautious 'gainst another time!
But if the sexton's fault an hindrance be,
We call from him a double penalty.
If any should our parson disrespect,
Or wardens' orders any time neglect,
Let him be always held in full disgrace,
And ever more be banishèd this place;
Now round—let goe—with pleasure to the ear,
And pierce with echo through the yielding air.
So when the bells are ceased, then let us sing,
"God bless the Church—God save the King!" [1700]

We must now return to the interior of the Church.

The windows appear to have given the churchwardens constant trouble and expense. In the very first account (1635–6) £8 was paid to James Stone for repairing and amending the glass windows of the church. In 1639–40 we find entries relating to a new window, which appears to have been the middle chancel window. 245 feet of Pentuan stone were used, costing 1s. 2d. a foot. The glazing cost £6. Then follow charges relating to stained glass, I think ;—

Paid for the arms in the window, being 16 *feet at* vij*s. per foot,* vl. xij*s.*
Pd. for carrying it from London, and setting it up, x*s.* x*d.*

There are also charges for wire for protecting the window.

1642. *Item pd. William Egdcombe, the beedle, for keeping the boyes from the church window for one year,* xs. vj*d.*

1643. *Pd. James Stone for glassing the windows of the church this year,* vl. xiij*s.* v*d.*

1647–8. Glazing the windows cost £6 18s. 5d., and in the same year is ;—

Item pd. two men for watchinge the church when the windows were broke, ij*s.* vj*d.*

1651–52. *Glaziers,* iv*l.* x*s.* x*d.*

1659-60. *Repairing glass windows,* x*l.* xiv*s.* xj*d.*

The next year glazing the windows cost £8 6s. 6d.

1672–73. *Pd. Wm. Woodmason for taking down all the glass windows of the church, new leading, soldering, banding, and for many foote of new glass, as per receipt,* xl*l.*

In 1674–75 further expense ;—

Pd. Robert Mingo for mending all the glass windows in ye church, five of them being exceedingly broken on the 29*th of September by fyering of chambers,* ix*l.* xv*s.*

1690. *Payd Oliver Wrath in full, for repairing the windows in moor-stone worke,* xx*l.*

In 1717, many of the windows were blown out in a violent storm, and £40 was collected of divers people, it is said as free gifts, and a workman from Calstock was brought down to view the damage, for which he was paid 2s. 6d.

Until 1594, the whole of the sittings were on the floor of the Church, but in that year a gallery was erected, which was situated, as far as I am able to judge, at the western end of the church. This was added to subsequently, for the accommodation of the blue and green boyes. This gallery seems to be always mentioned as "*the* gallery."

In 1639, I believe I am right in stating, the gallery in the north aisle was built. We have an entry of the cost of making a doorway in the north side of the church, and there was not long after a gallery there. The cost of this gallery clearly did not come out of the Church funds, but must have been obtained by private contribution.

In 1718, another gallery was erected in the south aisle for the use of the charity children. The money was obtained from the stock of the poor children educated in the charity schools of the town ; the gallery being intended for the use, as the books state,

of the charity children for ever. But observe the way in which the pew system demoralizes even churchwardens. In a very short time, although the gallery was intended for the exclusive use of the charity children, and so expressly dedicated, the churchwardens could not resist making a profit out of it, and we soon find the ominous entry, followed by others of the same kind, inserted in the most barefaced way, "Received for sittings in the new gallery, 15s."

I cannot vouch for the accuracy of my account of the galleries. There is an amount of uncertainty about their history, but there is no doubt that up to 1826 there were three large galleries extending from the west far into the Church, and on the north and south as far as the columns of the nave, the supporting beams being let into holes cut in the columns. On the fronts were painted, as we have seen, the arms of the town and diocese, something in the way we find them at St. Budeaux. They were also ornamented with sentences, I suppose Scripture texts; for we find Philip Pearse was paid 16s. in 1721 "for new painting the sentences over the gallery and numbering several pewes."

There was up to the time of the 1826 alterations, over the south porch a parvise so frequently found in Perpendicular churches, and so well known as an adjunct to so many of our Devonshire ones. This was used as a vestry, but Mr. Foulstone destroyed it and the staircase leading to it.

The rood-loft staircase is enclosed in a turret on the exterior of the southern chapel. It was until recently blocked up, and hidden on the inside by the Strelly monument.

In the eastern pier of the same south chapel is a squint or hagioscope, measuring on the south 2ft. 4½in. high by 12in. wide, and on the north 2ft. 7in. by 14in. wide; and from its position and size, I am inclined to think that it could not have been intended to be used by any portion of the congregation, but by the ringer of the sanctus bell at the consecration. It is not large enough to allow of more than one person to look through at a time; and although there is nothing at present to indicate the existence of the bell-cot outside, I believe that originally one must have been there. At Tanfield, in Yorkshire, is a very remarkable squint, so constructed in a buttress as to enable the bell-ringer to command a view of three altars. The tolling of the bells at the present time at St. Andrew's after matins is a relic of the sanctus bell, as the bell

rung at seven o'clock on Sunday mornings is a relic of the early mass or communion now unfortunately discontinued.

I may as well mention another use for squints of this size and character. The object of the aperture was to enable the priests at the side altars and in the chantries to take part in the service, so that when the Holy Eucharist was administered to very large congregations the bread or wafers, which had been consecrated at the high altar, might be divided into portions and carried to each of the side altars, and from thence distributed to the communicants, by which means a much larger number were enabled to communicate simultaneously. A revival of this custom was suggested some time since in our cathedrals and churches in large towns; but the increased number of celebrations has obviated the necessity for it.

The goods of the church are not, and have not been for three centuries, of any great value.

The following is a list of them in 1635 :—

Imprimis. One fayre Bible of the largest volume.
Item. Two bookes of Common Prayer of the largest volume.
Item. Two books of Martyrs, the one in English and the other in French.
Item. One book, called Jewell's Works.
Item. One book of Homilyes.
Item. Two register books for christenings, weddings, and burials.
Item. Three surplusses, two for the ministers and one for the clerk.
Item. One fayre silver cupp for the communion, double gilt, with a silver cover and a case of leather to put it in.
Item. Three other silver cupp, gilt, with covers of silver and cases for them.
Item. Two silver plates.
Item. Two great pewter pots and two pewter plates.
Item. One fayre velvet pulpit cloth and cushyon of the same.
Item. The old pulpit cloth and cushyon of velvet.
Item. One new table board for the communion.
Item. One greene carpet of broad cloth.
Item. Two lynnen table-cloths and six towells.
Item. One white basket.
Item. One iron-bound chest with three locks to keepe the register books.
Item. One crowd.

This crowd, I suppose, means a barrow, but the "d" may be an "e," in which case it would be a crow bar.

The single chalice left by the Commissioners did not serve very long, and the goods enumerated in the above list were added to from time to time. The three small chalices are dated 1590, 1616, and

1635; the chalice, which was the gift of the Earl of Bedford, 1628; and the two patens were the gift of Walter Matthews. He was mayor in 1604. In 1677, the churchwardens received from Anthony Smith, the executor of the late vicar, Dr. Ashton, the large silver cup with his arms engraved thereon, and in the same year they bought the covered cup and the two large silver patens. They weighed 76 ounces, at 5s. 8d. per oz., the total cost being £21 17s. I can find no account of the purchase of the paten with the date 1685 upon it, nor do I know where the two old flagons, said to have been exchanged for a large new one, at a cost of 4s. 6d. in 1679, came from, or what has become of the latter so obtained. It does not appear in any inventory further on, and there is no such flagon now in the custody of the churchwardens; but in the inventory for next year a silver basin is mentioned, which is still in existence, and this is perhaps what is meant.

If there were any organs in the church they were destroyed in Puritanical times. It is curious to notice how much hostility these instruments have from time to time encountered. The Lollards objected to them, the Cistercians proscribed their use, the Puritanism of the civil war hated them, and doomed most of those in England to destruction, and Scotch Presbyterianism called them "kists o' whistles."

The first account we have of an organ in St. Andrew's is in 1735, when one built by James Parsons was opened on the 7th December in that year. The choir from Exeter Cathedral attended the services on the occasion (they are called singing men), and the vicar, Mr. Mudge, preached. I cannot find what was paid for the organ; but the money was raised by subscription, and so was the salary of the organist, John Evans. In 1748 James Parsons cleaned it, charging 8s. for the work; and in 1749 the subscriptions for the organist's salary fell off, and the vicar made up the required sum. This was repeated several years; but at last the salary of £14 is regularly entered by the churchwardens in their accounts, and it was increased by an endowment and an annual payment from the town. The organ, renovated and improved, remains still in the church. In 1737 Samuel Addis bequeathed £400, the interest of which was to be applied towards the salary of the organist. There were chorister boys at one time in the church. I find a reference to them in 1737–38.

It is interesting to find Walker's story of William Hobbs, the clerk of St. Andrew's, confirmed. He was frightened to death while burying a corpse in the yard, the Puritans threatening to throw him into the grave if he came there again with his mass-book, that is, the book of common prayer. In the earliest book we find him clerk, receiving £7 per annum, in addition to burial and other fees, and £2 10s. for keeping the burial account, and 10s. for keeping the register. He died in 1643; and the balance of his salary was paid to his widow. His successor, Henry Champlyn, who was appointed to keep the register by the mayor in 1653, appears to have been the clerk until 1683, and was, I believe, succeeded by his son, who was clerk until 1716, the two thus holding the office for about 73 years.

Before leaving the accounts, let me refer to some entries worth notice, and first as to the same subject of clerks.

In 1635, when the churchwardens' accounts begin, we find entered certain sums received every year from persons who are named and described as collectors for each of the then wards, four in number, as well as collectors for Stonehouse and Weston Pendrell (otherwise Peverell), and Compton Gifford. These moneys are called clerk's wages and quarter pence, and amount generally to about £20 per annum. They were regularly received down to Easter, 1642, when, although the wording of the entries is continued annually to 1648, the churchwardens seem to have been unable to obtain payment, and no figures are carried out; and in 1648 all reference whatever to them ceases.

Now these entries at first puzzled me very much; but, thanks to the Rev. Mackenzie Walcott, who put me on the track, I have ascertained their meaning.

"Parish clerks were formerly men of letters, and it was a part of their work, by the Constitutions of the Bishop of Coventry, 1237, to teach a school in the parish. They were also, in order to increase their emoluments—always small—to have conferred upon them the office of water-bearer (*aquæ-bajalus*); *i.e.* an assistant to the minister in carrying the holy water. They were sometimes elected by the parishioners (as was, I think, the case in Plymouth), upon whose alms they were supposed to live."* Although clerks were always supposed to be supported by voluntary contributions,

* Kennett, "Par. Ant.," vol. ii.

Archbishop Boniface decreed "that if the parishioners should maliciously withhold the accustomed alms, they should be earnestly admonished to render the same, and, if need be, shall be compelled by ecclesiastical censure." These *alms* were to be collected and levied according to the manner and custom of the place, which, inasmuch as it concernest the increase of divine worship, ought not to be changed at pleasure. And then Lyndwood (from whom I quote) goes on, and here is the explanation we want: "And custom of this kind is good and laudable, that every master of a family (for instance), on every Lord's-day, give to the clerk bearing the holy water somewhat according to the exigency of his condition, and that on Christmas-day he have of every house one loaf of bread, and a certain number of eggs at Easter, and in the autumn certain sheaves. Also, that may be called a laudable custom where such clerk *every quarter of the year* received something in certain in money for his sustenance, which ought to be collected and levied in the whole parish. For such laudable custom is to be observed, and to this the parishioners ought to be compelled; for, having paid the same for so long a time, it shall be presumed that at first they voluntarily bound themselves thereunto."* Notwithstanding which, I am afraid, if the present worthy parish clerk was to attempt to collect quarter-pence in the parish of St. Andrew, we should probably have disturbances to rival those we have recently heard of in Exeter. We thus see that a payment for wages, in lieu of loaves, eggs, corn, or otherwise, and a quarterly payment in money, was continued in Plymouth after the new state of things began at the Church. I suppose when the civil war began, and Puritanism was rampant here, all endeavours to collect such moneys failed, even if any were made, and although the churchwardens evidently hoped to revive the custom, their hopes were disappointed. Although they received, as I have said, about £20 per annum from this source, they paid the unfortunate clerk off with less than half the sum.

With a few extracts of interest, I must leave the accounts.

1635–6. Gyles was paid 10s. "for keeping out the dogges and keeping in the boyes." Such perverseness! This is a constant entry, and one we meet with in many parish accounts. It is somewhat strange to find dogs so troublesome in churches. They are not so now. It has been suggested that it was usual for the rat-catcher

* Lyndwood, 143. Burn's Eccl. Law, vol. iii.

to nail his victims to the church doors, and that these attracted the dogs. But from whatever cause, there is no doubt that they gave much trouble to churchwardens in former times.

In the same year 20s. 6d. was paid for a present of sweetmeats sent to the chancellor on the bishop's visitation.

1643. *Pd. for 7 lbs. of candles for the souldiers that were at the church ready to go forth on a party the 6th and 7th Oct. and 14th Oct.*

The quantity of wine charged for the sacrament about this time appears extraordinary. In 1643–44 *156* gallons are charged. The next year much less, but 36 gallons seems a great deal.

1649. *Item pd. for rodds for keepinge quiet of the boyes,* ij*d.*
1650. *John Lee, for keeping quiet the boyes,* xj*s.*
Hour-glass, xviii*d.*
1652. *Allowed loss on changing Spanish and Portugal money,* xxiv*s.*
1656. *Pd. Henry Eustice, Constable of the hundred, by virtue of a Warrant from the Justices of the County towards the building of a house of Judicature in the Castell Green of Exeter,* viij*l.* x*s.*

The total cost, it is stated, was £688 16s. 6d.

In 1659 is a startling entry :—

Item: Received for two old murderers that lay in the tower that were sold by the said wardens, the sum of iij*l.* iv*s.*

A murderer is a piece of artillery, a wall piece, a murdering piece, and this was a relic of the siege, doubtless.

The churchwardens seem to have been careless in their accounts during the civil war and Commonwealth, but at the restoration they were obliged to square up, and pay over the balances which they had retained.

The ordinary payments for killing so-called vermin, chiefly hedgehogs, occur constantly even down to this nineteenth century, and not far from our own day ; 2d. was the usual payment for a hedgehog, and one Abraham Bligh, towards the end of the 17th century, was the principal recipient. Sometimes there was a great prize, an otter was killed. In 1706, 5s. was paid for this exploit. A badger was supposed to be worth only 1s. In 1752, two badgers, four hedgehogs (the price of which had then gone up to 4d. each), and one fitch cost 3s. 6d.

In 1740–41 the accounts were kept with particular neatness,

and enquiries appear to have been made with some care in order to ascertain the actual income of the Church. I think the churchwarden was John Facey, linen draper and alderman, whose portrait is in the Athenæum. His comments on some of the charges made by the sexton, Samuel Rhodes, are very amusing. He objects to some items, and gives the reason. The sexton charges 4s. 6d. for a flasket to carry the plate in. Mr. Facey remarks that John Jenkin offered to sell him a similar one for 2s. 6d. For cleaning out the stiles, Mr. Facey says Rhodes, the sexton, paid and charges 2s. "For three bottles of oyle, at 1s. 4d. each, which he could not buy under 1s. 7d. each, and therefore I presume there was none used, 4s." By the bye, Rhodes took care not to make this mistake in subsequent years; the charge in after years is always higher. "For cutting down the weeds twice this year Mr. Rhodes paid but 4s., though he charges 5s." "For two hair brushes, for each of which he could not pay above 1s. 8d., and charges 4s." "For a dozen of brooms, for which he did not pay above 9d. or 10d., 1s. is charged."

There is a very painful note in 1606. The sexton was in the habit of receiving the moneys for bells and burials. In November and December this year there are no receipts, the reason given being, "Ye sexton ran away with ye money he received." In justice to the sexton, however, it must be said that he repented and made restitution; for in the following year the churchwarden says, "Received of the old sexton in money £3 4s., and by two bills, for which I have security, £6 10s. 4d.; in all, £9 14s. 4d."

In 1745 something similar happened. "N.B. The green velvet cloth with fringe much worn was stolen from the communion-table the evening that Lieut. Woolley was buried, being the 27th of February, 1745. Cash paid for crying the green velvet communion-tablecloth stole from the table, 6d." It was recovered; but how, or who the culprit was, does not appear.

And two more to conclude:—

1749. To a large umbrella for ye use of ye ministers at burials, £1 16s.

1751. Fees to Bishop's Court, for getting off the presentment of not having a hood, 12s. 3d. This doubtless refers to the then vicar, Mr. Mudge, not being a university man.

I think I have quoted from these volumes enough to show how much there is of interest and value in them.

I have still to glance rapidly at some other matters which must not be passed over in an account of this our Church.

The monuments and tablets within the building deserve especial attention.

The oldest inscription, I believe, is the one supposed to be a memorial of one of the Sparke family. When last I saw it it was in two pieces, having been broken in removal. I hope it has been preserved. It is stated by Mr. Worth to be of the date of 1583, and bears the following lines :—

"I was once as thou art now,
A man, could speake and goe
But now I ly in silence here
Serve God, thou must be so.

When death did me assail
To God then did I cry
Of Jacob's well to newist my soule
That it might never die."

If the date assigned to this stone is right (and it may be earlier), it is only two years later than the commencement of the Registers; but, as far as I know, there is nothing to connect the stone with the Sparke family. We have, however, a stone with 1583 upon it against the north wall :—

"Here lyeth the body of Mr. John Sparke
Departed this life the xix August
Anno Domini 1603, and also of Julian his
Wife who departed this life the xxviii
Of Dec: A.D. 1583."

There was a large stone, partly covered by the altar flooring, bearing the date 1598, and the Fownes' slab, formerly on the floor in the Foulstonian vestry in memory of Joane, late the wife of Master Humphrey Fownes, is dated 1589. It has the lines :—

"O that my words were now written
or graven with an iron pen in
lead or stone to continue: for
I know that my Redeemer liveth and
that I shall rise out of the earth
in the last day and shall be
covered again with my skin and
I shall see God in my flesh yea
and my sight shall behold him,
not with other but with these same eyes."

These three are the only stones we can with certainty assign to the sixteenth century; but the church is rich in monuments of the seventeenth. The history of these during this century would be almost the history of the town. We have the Fownes again in force, the Sparkes, the Northcotts, the Seelys, the Spurwells, the Schaggells, the Trelawnys, the Trevilles — names which to the Plymothian recall many a tale of his town's former glory.

The most conspicuous of the monuments are of this time. The strange Etruscan-like memorial of the Calmadys, the quaint one of the Sparkes,—old John Sparke, with his three sons by his side, and his wife Deborah, with her daughters and dead children; the quaint-figured tablets of Fowell and Goodyeare, and the fine monuments of Strelley and Skelton, were all erected in this century. Of this period also is, of course, Rebekah's tombstone,—

"Wife 17 years to Mr. G. H., Minister of the Gospel in Plymouth, interred near this pillar, and being dead yet speaketh."

Also the one,—

"To the precious memory of that truly vertuous gentlewoman
Mrs. Mary Sparke—

Life 's but a *Sparke*, a weak uncertain breath,
No sooner kindled but puft out by death.
Such was my name, my frame, my fate, yet I
Am still a living *Sparke;* though thus I die
And shine in Heaven's orbe a star most bright,
Though death on Earth so soon eclipst my light."

The eighteenth century, although its monuments are not so striking, has many worthy of notice; and some of those erected still more recently will rightly find their admirers.

The story of the inscriptions and monuments would occupy a separate paper. We shall find memorials to eighteen mayors of the town, to seven physicians, to many soldiers, and to more sailors. Strangely enough, the earliest I recollect to a sailor is the one which commemorates the services of that brave commander, Edmund Lechmere, who although wounded to death in an action with a French privateer, persevered in the battle, and won it, dying the next day. The date is so recent as 1703.

The heraldry of the church is worth study; but I can only glance at it now. Besides the Fownes, the Sparkes, the Waddons,

and others more particularly connected with the town, we have the arms of many county families, members of which have intermarried with Plymouth ones, or have become otherwise connected with the parish,—the Heles, the Gilberts, the Morsheads, the Skeltons, the Calmadys, the Trelawnys, the Rashleighs, the Bassets, the Drakes, the Pollexfens, and many others.

I must not omit to mention the six framed panels containing arms, of the history of which I have no information; nor the painted panel in memory of Philip Pearse, with winged skulls and cherubs' heads, and the inscription: "In memory of Philip Pearse, of this town, painter, who died the 16th day of February, 1724, in the 70th year of his age, and was buried near this place; as were also nine of his children." I spoke of Philip Pearse a little time since. He painted among other things the portrait of Charles I. which was set up in the church. He seems to have been the artist of his time; and doubtless the sign of many a Plymouth hostelry was his handiwork.

To Mr. Alfred Hingston, now and for many years past one of the churchwardens, it is owing that the monuments are so well preserved. Before his time they had had little or no care bestowed upon them. Some were against the pillars, some were hid in corners; the Strelly monument, found in fragments, was stowed away in some forgotten locality, the Lechmere monument fell, and was broken into a hundred pieces, but Mr. Hingston turned them out, had them cleaned, put together, and painted, and so preserved them, we may hope, to many a succeeding generation.

Up to the end of the first quarter of the present century St. Andrew's Church was a forest—pews here, pews there, galleries full of pews, pews everywhere. Wherever it was possible to get in a pew, a pew was got in. And these pews were pews of the approved fashion of a hundred years since, comfortable boxes, high and snug, fit perhaps for sitting and sleeping in, but unfit for everything else. In addition to the large number of pews, to add to the general effect, the ceilings were coloured dark blue and red. But this was the usual state of things in every church at this time, and I do not wish to imply that St. Andrew's was worse than most others. The parishioners became aware of the defects in their church in 1816, and in 1817 a committee was appointed to take the matter (in addition to others) into consideration. In October, 1818, there was

a meeting of the churchwardens and parishioners, and it was resolved, "That it is the opinion of this meeting that it is necessary to make some alterations in the Church for the better accommodation of the parishioners." Resolved, "That it is the opinion of this meeting that the most eligible mode of effecting this alteration will be by dividing off the lower part of the Church as a separate place of worship." Resolved, "That the committee be requested to obtain an estimate of the expense of effecting this alteration." On the 18th December following there was another meeting, and it was resolved, "That it is the opinion of this meeting that the plan now submitted to the vestry by the churchwardens and committee be approved, subject to such minor improvements as may occur to the churchwardens and committee to be necessary." The churchwardens went for their plan to Torpoint, where resided a person called Hutchens. To him they applied, stated their wants, and he furnished them with a plan, which was approved by the churchwardens, committee, and parishioners of St. Andrew in the year of grace 1818. Observe the proposed arrangements. Utilizing the north and south porches, and erecting a permanent wall from north to south, the Church was to be divided into two portions, the western being the largest, both provided with large galleries, the one at the west end of the Church, the other at the east, and with altars opposite, furnished, of course, with three-deckers for the accommodation, as it appears from the plan, of the "clerk, reader, and preacher." There is apparently no provision for vestries, but near the font at the west end of the larger chapel are two rooms, the one called the "minister's registering room," the other on the opposite side "waiting-room for nurses." The arrangement of the altars is worthy of note, and the entrances to the tower were to be stopped up. It is not very clear what Mr. Hutchins intended to do with the tower, perhaps take it down altogether, as useless in the new arrangements. Nothing more clearly shows the horrible state of things prevailing at this time. Puritanism never dared to suggest such a mutilation of the sacred edifice. To this plan the churchwardens were desired to obtain the approval of the mayor and commonalty as patrons, the ordinary, the incumbent, and others; but, whether this consent was not to be obtained, or for what other reason, I do not know, the scheme was dropped.

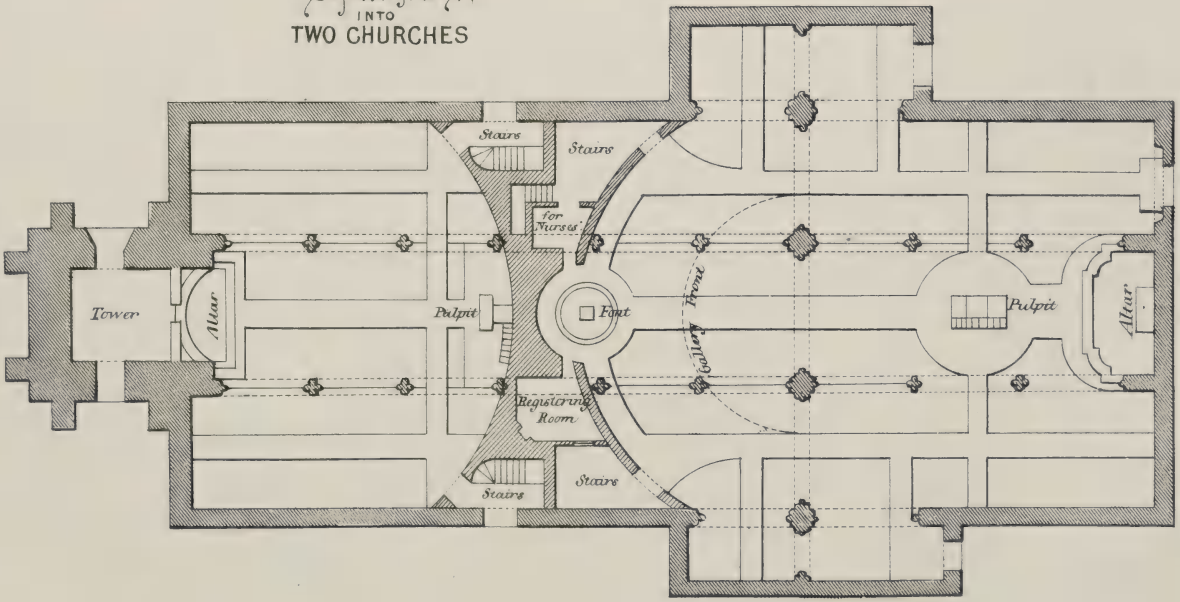
But in 1824 further action was taken; and it was decided that something must be done, and eventually it was resolved that the

DESIGN FOR CONVERTING

St Andrew's

INTO

TWO CHURCHES



plans prepared by Mr. Foulston for the alteration and improvement of the Church should be adopted; that a faculty should be applied for, the money required raised, and a committee of fifteen should be chosen equally from the corporation, pewholders, and parishioners, to protect the rights of all parties, and to assist the churchwardens in forwarding the work.

This committee did not give general satisfaction, for I find shortly after, that another committee was appointed, and they reported soon after, among other things, most pitifully that "the attention of the committee had been directed to the large portion of the Church occupied by the mayor, magistrates, and common council, without any adequate compensation; and that it was reasonable to suppose that they would contribute towards the immense sum of £4,500 expended, as they had within a few years sold the next presentation for not less than £4,000, and should have contributed handsomely towards the liquidation of the unexampled sum of £4,500; or if not, that they had at least contributed some portion of the expenses incurred by the ornamenting of the seats solely occupied by them; but your committee regret to inform the meeting that the corporation had not paid or subscribed even one shilling. However," brightening up a little, "on the other hand, it is with pleasure your committee state that they find a few highly-respectable members of the corporation did individually for a certain period make a remuneration for their sittings; but, as it is supposed, in consequence of their example not being followed by others of the corporate body, they have now also withdrawn their individual contributions and support; and the fact now is that not a farthing is received from the corporation for sittings, although the aldermen and common council consist of not less than thirty-six individuals, occupying the best, most extensive, and highly-ornamented pews in the church. Before the committee close, they beg to observe that it is their opinion, that the committee which was appointed for protecting the interests of all parties should, previously to fitting up the pews occupied by the corporation in their present expensive and extravagant manner, have had a meeting with the mayor, aldermen, and common council, so that their feelings as to contributions should have been fully understood, and that such committee, by the result of that meeting, should have been guided as to whether they would increase the burden of the parishioners by show or splendour in and about the

pews occupied by the corporation, or confined their measures to the same plain state and condition the sittings are, as occupied by other persons moving in as equally a respectable sphere of life."

I have quoted this as an example of a nineteenth century entry, I do not think anything more amusing was ever penned by mediæval scribe.

The result of Mr. Foulston's so-called restoration is well known. The church was cleared out from end to end. In April, 1826, the materials, comprising the seats, galleries, together with the screens, and no one knows what other valuable remains of the Church's former grandeur, were sold by auction, and realized the sum of £134 15s., as appears by the churchwardens' accounts. Mr. Foulston had no feeling for Gothic architecture, or reverence for the traditions of the past. He was the Wyatt of St. Andrew's, and he spared nothing. I think we may take it for granted that the Church had received little or no permanent injury before the restoration committee and Mr. Foulston took it it hand. But what did the architect do? We know something of what he did. His sole object apparently was to eliminate every trace, so far as he could accomplish it, of interest and antiquity in the Church. He blocked up the doorway from the south chapel, he blocked up the priest's doorway, he blocked up the rood-loft stairs, he blocked up the tower arch. He pulled down the parvise chamber over the south porch, he destroyed the screen, he mutilated and buried the sepulchral effigies, he made the crypt a charnel-house, disfigured the chapels, and contrived galleries of sham Gothic—sham in style, sham in material. By the high pews and narrow gangways, and the abolition of the central passage, with the enclosure of the tower and the westernmost bay of the nave and aisles, he dwarfed the building and destroyed its proportions. He found the church choked up and encumbered, it is true, but not mutilated; he left it neat and tidy, but a wreck and a shadow of its former noble self.

Plymouth owes a debt to the present Vicar of St. Andrew's, which it will not easily pay, for his persevering and successful endeavours to undo the work of Foulston, and to make his church more worthy of the town, of its antecedents, and of that branch of the Church Catholic to which it belongs. But there is still much to do.

St. Andrew's is to us cathedral and parish church. Before

Plymouth was, the Church of St. Andrew existed; before mayor, corporation, or parliamentary representation were the possessions of our fathers, there was St. Andrew's Church; not perhaps as we know it now, but still St. Andrew's Church. Not a building in the town is as old even as its tower. It is our duty to pass the fabric on to those who come after us better than we received it from those who preceded us. In that Church how many holy services have been performed? How many sacred rites have comforted the souls of generations? To how many has it been a quiet habitation; what countless numbers rest within and about its walls? And as age after age hands down the trust committed to it, may that Church continue long to fulfil its mission; and while men come and go, though opinions may change and feelings alter, may the doors of the old Church of St. Andrew be always open, inviting all, high and low, rich and poor, Sunday by Sunday, on festival and fast, day by day, to show forth their faith in worship and in prayer.

NOTE.—I have to express my thanks to the Vicar and Churchwardens of St. Andrew's, to Mr. J. Hine, F.R.I.B.A., to the Rev. Prebendary Walcott, to Mr. J. Hayward, and to Mr. N. Vickers, for valuable assistance rendered.

THE SIEGE OF PLYMOUTH.

A CHAPTER OF PLYMOUTH HISTORY RE-WRITTEN.

BY MR. R. N. WORTH, F.G.S.

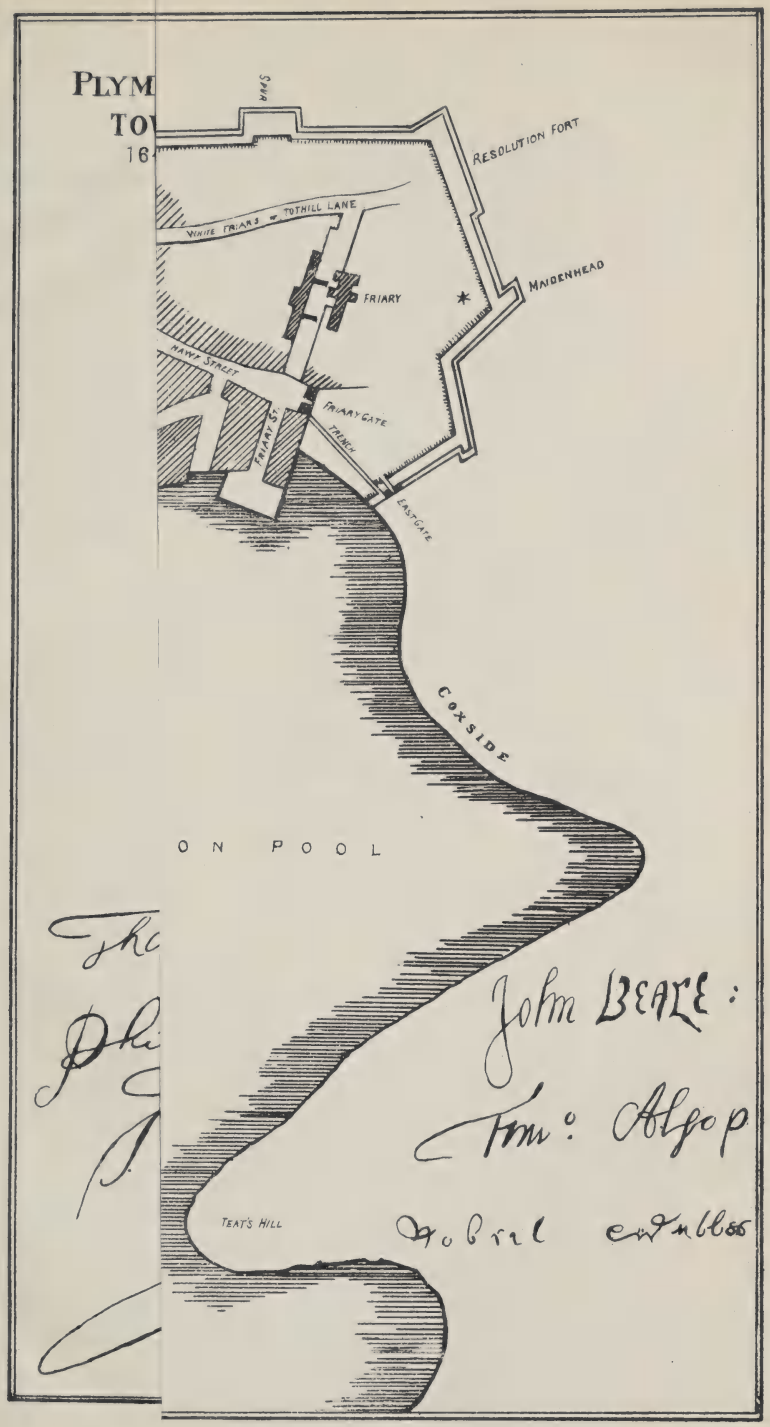
(Read December 18th, 1874.)

For six hundred years has Plymouth been a fighting town. For nearly five hundred years have its shores been constantly familiar with

"Thunder of fort and of fleet."

Many an expedition destined to act against a foreign foe has assembled in its waters. Again and again has the foeman retaliated by carrying the war within its borders. But none of its warlike memories stands out so forcibly as that with which we have here to deal. The Siege of Plymouth marks an epoch of the first importance in our national as well as in our local history. Foremost in defending the liberties of England in the 16th century, when the haughty Armada was launched against our shores; no town in the West of England—London excepted, none in the whole kingdom—did more for the defence of these same liberties in the 17th, when they were assailed from within. There are places in the West that have been besieged more often; Plymouth alone can claim the proud title of a maiden town. Bristol, Exeter, Taunton, have been attacked, and have fallen again and again. Plymouth endured a Siege longer and fiercer than either of theirs, and sustained it to the end.

It singularly happens that while there is thus no part of our local history of which we may be more justly proud (for those who hold that Plymouth took the wrong side in the great conflict cannot, I think, help admiring its stoutness in defence), there is none so little known. I have called this a chapter of Plymouth history re-written; the chapter has hardly been written at all.


PLYM
TO
16
SWAN
RESOLUTION FORT
WHITE FRIARS
TOTHILL LANE
FRIARY
MAIDENHEAD
HAMS STREET
FRIARY GATE
FRIARY ST.
TRENCH
EASTGATE
COXSIDE
ON POOL
John BEALE :
Tho: Alsop
TEAT'S HILL


PLYMOUTH
TOWN
1645
St GEORGES FORT
OLD TOWN GATE
CHARLES FORT
TERROR FORT
NORTH or GASKING GATE
SPUR
RESOLUTION FORT
MAIDENHEAD
WEST or FRANKFORT GATE
SPUR
FRANKFORT
WHITE FRIARS or TOTHILL LANE
FRIARY
HIGHER or HAWE STREET
FRIARY GATE
TRENCH
EAST GATE
GASKING St
WHITECROSS St
GREEN St
CHARLES C.
VENNEL St
MOONS LANE
OLD TREBBLE
BRITO
MARTIN'S GATE
FRIARY St
BILBURY St
OLD TOWN
WEER STREET
TREVILLE St
COLMERS LANE
BUCKWELL St
HOWS LANE
TIN STREET
PIKE or LOOE St
BASKET St
LOVE LANE, WESTWELL St
HOSPITALS of ORPHANS' AID & POOR PORTION
CATHERINE St
St ANDREWS CH.
WHIMPLE St
GUILDHALL
LOADERS LANE
LINAM LANE
PATRICK LANE
HIGH or MARKET St
BATTER St
HICK LANE
VAUXHALL St
STILLMAN St
FINEWELL St
St ANDREWS St
CAFTE St
NOTTE STREET
VINTRY St
WOOLSTER St
HOE LANE
NEW QUAY or PARADE
BLACK FRIARS
FRIARS
PINS LANE
SOUTHSIDE St
NEW St
HOE GATE
CASTLE
BARBICAN or SOUTH
GATE
SUTTON POOL
COXSIDE
TEAT'S HILL
1641-2
1642-3
1643-4
1644-5
1645-6
John BEALE

But one attempt has been made to present a complete view of the Siege operations, and that necessarily an outline only. Other essays to deal with this subject have been founded upon the basis of some one or two of the quaint contemporary pamphlets, in which narratives of different episodes of the Siege are set forth, and are therefore very fragmentary. My aim is to present a complete view of the entire series of sieges and blockades extending from the autumn of 1642 to the spring of 1646, which, for convenience' sake, we group under the one common title of "*the* Siege." My materials are drawn from the general historians of the time — Clarendon, Whitelock, Rushworth, Dugdale, Vicars, Saunderson; from the old Siege tracts; from the Domestic State Papers in the Public Record Office for the years under record, which are not yet calendered, but which I have carefully gone through; from the registers of St. Andrew Church, which I was readily permitted to examine by the Vicar, the Rev. C. T. Wilkinson—having in that examination the ready aid of Mr. White, the clerk; from our Corporate Archives, for access whereto I am indebted to the courtesy of Mr. Whiteford, our Town Clerk; from the family muniments of the Earl of Mount Edgcumbe, by his lordship's kindness; and from sundry other sources which do not here call for special mention. With these preliminaries I begin my narrative.

At the commencement of the differences between Charles and his Parliament, the general feeling in the West was unmistakably on the side of the latter. No other part of the kingdom contributed so many leading men to the popular ranks in the House of Commons. Sir John Eliot, of St. Germans, one of the purest and most high-minded of patriots, died under kingly persecution. The great Pym was burgess for Tavistock; Strode sat for Plympton; and as Hampden once represented Grampound, we western folk can claim three of the great five whom Charles if he could would have made share Eliot's fate. Plymouth itself was strongly Puritan, as well as Parliamentary in its leanings. Yet one of the members whom it elected to the Long Parliament—Robert Trelawny—was so determined a Royalist, that he was expelled the House, in 1641, for saying that it could not appoint a guard for itself without the king's consent, on pain of high treason. In his stead, Sir John Yonge was chosen. Trelawny was a merchant; and when hostilities were imminent, placed his vessels at the disposal of the king, and had a quantity of his goods removed to the royal garrisons at

Pendennis and St. Michael's Mount, where they served as welcome supplies.*

The Plymothians of these times were a bold, determined sort of folk, who formed their own opinions, and knew how to maintain them. The Elizabethan era had left its mark upon the community. The atmosphere of daring and adventure which then surrounded the old town influenced those who came within its reach. And although these great days were gone, their memory was fresh.

"When civil dudgeon first grew high"

there were still among the elders of the borough many who had known Drake, and Hawkins, and Raleigh, and Frobisher, and Grenville, and Gilbert—some perchance who had sailed with them; many who had watched with kindling eye and eager heart the haughty Spanish fleet sail by to its destruction. The half century that had passed had not tamed the spirit nor weakened the energies which made Plymouth the first port in the land in the days of Elizabethan glory. These only slumbered; and I for one feel no surprise that the town was one of the first to declare on the Parliamentary side. Clarendon shall tell us how. He says that Plymouth

"Was a rich and populous corporation, being, in time of peace, the greatest port for trade in the West; and, except Bristol, then more considerable than all the rest. There was in it a castle very strong towards the sea, with good platforms and ordnance; and little more than musquet-shot from the town was an island with a fort in it much stronger than the castle, both of which were, before the troubles, under the command of a captain with a garrison of about fifty men at the most, and were only intended for a security and defence of the town against a foreign invasion, the castle and

* I find the following references to Trelawny's vessels among the Domestic State-papers in the Public Record Office: "These are to certify that there is landed at Falmouth to his Maties use out of ye *Richmond of Plymouth*, belonging to Mr. Robert Trelawny," 3½ barrels of powder, 8 musquets, 6 swords, 7 skeynes of match, and 1032 bushells of salt; out of the *Little Richmond*, 147 bushels of French wheat, 13 sides and 1 hogshead of pork; and out of the *Tyger of Plymouth*, 22 chests of sugar ("sucar"), belonging to Trelawny.—4th March, 1642-3, John Arundell. 14th Jan., 1642, "Saved for his Majesties use on board the *Richmond of Plymouth* 681 ounces of plate, one gold hatband 99 links 3 ounces weight, being goods of R. Trelawny." —Nicholas Slanning. 16th Feb., 1642. Received at St. Michael's Mount, out of the *Richmond*, 150 bushels of wheat, the goods of R. Trelawny.—Francis Basset. I have slightly condensed this document; only the quoted parts are verbatim.

the island together having a good command of the entrance into the harbour; but towards the land there was very little strength. This command was in the hands of Sir Jacob Ashley, and as unprovided to expect or resist an enemy as the other castles and forts of the kingdom, less for the receiving a recruit, there being only ordnance and ammunition, without any other provisions for the support of the soldiers within the walls, and the garrison itself being by time, marriage, and trade incorporated into the town, and rather citizens than soldiers; so that Sir Jacob Ashley, being sent for to the king, before his setting up his standard, as soon as there was any apprehension of a party for the king in Cornwall, after the appearing of Sir Ralph Hopton and those other gentlemen there, the Mayor and Corporation of Plymouth quickly got both the castle and island into their own power."*

The king's standard was hoisted at Nottingham on the 25th of August, 1642. It must therefore have been in the mayoralty of Thomas Ceely that the town thus declared against the king. Ceely was succeeded on Saint Lambert's Day following (September 17th) by Philip Francis, a man of considerable energy and resource, and one of the chief leaders of the townsfolk throughout these troublous times.† To him the Parliament, when they learnt what had occurred, gave the command of the castle and town, about which "a line was cast up of earth, weak and irregular." To Sir Alexander Carew, one of the representatives of Cornwall, and member of a committee of defence appointed to assist the mayor, was given the charge of the fort and island, regarded as the key of the whole position, with a sufficient garrison.‡

The first attack came from Cornwall. Sir Ralph Hopton, the King's Lieutenant-General of Horse in the West, with Sir John

* "History of the Rebellion," edition 1807, vol. ii., p. 590.

† The following receipt for arms is among the Corporate records:

Primo die Octembris Anno dni 1642.

This daye received by mee John Carter esqr commissary of the right worth. Phillip Frauncis, Maior of Plymouth, these severall armes following; Videlt.,

Eleven brests
Eleven backs
Thirteen head peeces
Five gorgetts
One currasse cappapee
One fowling peece
One muskett
Two great saddles

I say receved by mee

JOHN CARTER.

‡ CLARENDON, vol. ii., p. 592-3.

Berkeley and Sir Bevill Grenville, assembled a party in that county. To put them down by force of law, a bill was presented against them at the Michaelmas Quarter Sessions held at Launceston, in 1642, as "certain persons unknown, who were lately come armed into the county against the peace;" and Sir Alexander Carew and Sir Richard Buller gathered the Parliamentary forces at Launceston to cut off their retreat. But the tables were turned. A counter bill was preferred against the Roundheads as being a rout and an unlawful assembly. It was found by the Royalist grand jury, the *posse comitatus* was called out, and Carew and Buller, with their followers, driven out of the county. Saltash was the last place the Parliament held. It had a garrison of 200 Scots, but Hopton soon cleared them out, and thus the Parliament, who had thought both Cornwall and Devon in their hands, were very plainly undeceived. Nor was this all. There was a constitutional principle—Clarendon, true to his instincts, calls it an "old superstition"—that trained bands, or militia, could not operate out of the county in which they were raised, and at the orders of whose high sheriff they were. When, therefore, the Cornish *posse comitatus*, which consisted of 3,000 foot, had done its work, it was disbanded; but the Royalist leaders raised voluntary regiments, wherewith they made continual incursions into Devon, even to the very walls of Plymouth and Exeter, both garrisoned against the King.

Plymouth was first attempted in November and December, 1642, by Hopton, with about 2,500 horse and foot. The town was then under the command of Col. William Ruthven, afterwards Lord Grey de Ruthven, a brave and able soldier, but singularly deficient in that grand Scotch characteristic, caution. Like a wise captain, however, so far, he had garrisoned certain outposts, Plympton among them. Hereupon Hopton came down in such force that the Roundheads had to retire. But they did not go far. A retreat across the Plym enabled them to cover their front by that river; and the Cavaliers were too wary to attempt what was beyond their power. We read that on the 1st of December the garrison "stood upon the Laira for the space of three hours facing the enemy, who attempted one charge to have drawn us to their ambuscades; but durst not with all their force, which we judge was at least 2,500 horse and foot, give in a charge upon fair ground."* So Hopton in his turn retreated upon Modbury,

* Siege tract.

where, notwithstanding he had in the interim received reinforcements, he was on the 7th of the month surprised by Ruthven, with four troops of horse and 100 dragoons, and routed.

Probably it was this success that determined the Parliament to carry the war into the enemy's country. The forces of Dorset and Somerset were ordered to join those of Devon, and march into Cornwall—one body under the command of Ruthven, the other under that of the Earl of Stamford, governor of Exeter, and general for the Parliament of the five Western Counties. Ruthven led the way. He tried to force the passage of the Tamar at Saltash, but was repulsed with loss. He then led his forces up the eastern bank, and crossed by a bridge—according to Clarendon —about six miles above. If the distance given be correct, the bridge must have been a temporary one, and its place somewhere near Pentillie. Other authorities name Tavistock New-bridge—*i.e.* Gunnislake—as the spot where Ruthven entered the county, which is far more likely. And here Ruthven displayed that remarkable want of caution to which I have alluded. Instead of waiting for Stamford, he pushed on to Liskeard, and was utterly defeated on the 19th of January by Hopton at Braddock Down. With the remnant of his shattered army he fled to Saltash, where he hastily entrenched himself, and where, with the aid of a ship of 400 tons carrying sixteen guns, he hoped to make a stand. Hopton followed him up with vigour; and as a regiment which the Earl of Stamford had sent to Launceston fled to Plymouth, he was enabled to give his undivided attention to Saltash. The assault was made at four o'clock on the afternoon of Sunday the 22nd of January. For three hours the storm continued; and at length in the dark the town was captured, Ruthven and his principal officers escaping by boat to Plymouth. The loss of the Parliamentary troops was very great: seven score prisoners to add to the 700 taken at Braddock, arms and stores for 4,000 men, and the ship, the master of which was accused of treason in that, though hired to "batter" Hopton, he did not do so. The Royalists claim that they only lost one man; but this we may take leave to doubt.

Plymouth was now menaced for the second time, and far more seriously. Flushed with success, the whole of Hopton's forces sat down before it. We learn their disposition from a letter of Sir Bevill Grenville to his wife, dated Plympton, February 20th,

1643:* "Our Army lyes still in severall quarters. Sir Rh. Hopton, with my Lord Mohun, is upon the north side of Plimouth with two regiments; Collo. Ashbourn [Ashburnham], Sir Jo. Berk [Berkeley], and I are on the east side with two regiments; and Sir Ni. Slan [Nicholas Slanning], with Jack Trevan [Trevanion], were sent the last weeke to Modbury to possess that quarter before the enimy come, being the richest part of this countrey, whence most of our provision and victualls does come. If it were taken from us we might be starved in our quarters." Grenville saw no hope of taking Plymouth. It was too well supplied by sea, which the besiegers could not hinder.

When Sir Bevill wrote, the Parliamentary forces were concentrating themselves in the direction of Kingsbridge. They attacked the entrenched camp at Modbury four days afterwards—on the 24th February—and again won a complete victory. The Bideford and Barnstaple men led, followed by the London Gray-coats, and supported by about 400 horse and dragoons. The Cavaliers were routed as completely as in the previous December; and five pieces of ordnance, 200 arms, and 120 prisoners captured. There was taken also one Alderman Fittock, the master of the Newcastle ship which was said to have betrayed its trust at Saltash; and it was reported, though falsely, that Slanning was among the killed. The effect was at once seen. The Cavaliers, compelled to raise the Siege, fled in such haste that they left behind them three great guns and much powder.

Efforts were now made by the more moderate sections in the West to conclude a treaty of peace between the two counties, and the proposals were discussed by commissioners at Mount Edgcumbe, Stonehouse, and elsewhere. An agreement was arrived at, both sides being heartily tired of the conflict, though it had but begun. The Parliament, however, would have none of the treaty, and hostilities soon recommenced.

About this time Sir George Chudleigh was the governor of "Plymouth, Mountwise, and other Castles thereabouts," having under his command 2,000 foot and 500 horse. "Barronet Norcot,"† with his regiment of about 1,200, was quartered near Roborough

* I have made all the dates agree with the modern computation. This letter is dated 1642, the year then commencing in March, not January.

† Northcote, ancestor of Sir Stafford Northcote, the present Chancellor of the Exchequer.

Down to hinder the passage from Cornwall by Saltash, where Sir Nicholas Slanning had 1,000 men. And so a petty border warfare was carried on, the Cornish generally having the advantage, daily stealing horses, sheep, and oxen.

In April the Earl of Stamford made another attempt to subdue Cornwall, marching thereinto all the forces at his disposal. They were utterly defeated and dispersed on the 6th of May at Stratton; and Chudleigh, who had won a partial success at Bodmin, beat a hasty retreat to Exeter.

By the expedition of the Cornish forces eastward, which terminated so fatally for their leaders—Sir Bevill Grenville being killed at the battle of Lansdowne, Col. Trevanion and Sir Nicholas Slanning at the siege of Bristol, and Sidney Godolphin, the other wheel of the wain,* at Chagford—Plymouth was left awhile to itself. The inhabitants made the best use of their time. The Black-book of the Corporation contains "An order made the fifth day of Julye in the xixth yeare of the raigne of our Sovereigne Lord Charles, annoque dni 1643, for the erection of a wall rounde the towne of Plymouth for the better defence and safetie of this towne agst the Enemyes nowe in armes agst the Parliament." The order was made by the mayor, magistrates, and commonalty, and ran—"There shall be a wall with all expedition erected and Lenged [lengthened] for the better defence and safetie of this Towne agst those Enemyes that dayly threaten our s^{d} burrow, and that every Inhabitant of the same shall be reasonably rated and assessed for and towards the Charges and Costes of lengthening and erecting the same according to their respective estates and substance."

I take it that at the date of this order there were no Royalist forces of any strength in the neighbourhood, but that it was thought wise to be prepared for what was seen to be inevitable. There is a tradition that women and children aided in the work of fortification. The word lengthening affords us some clue to the character of what was done.

The fortifications of Plymouth date from the fourteenth century. Edward III. in 1374 made an order that the town should be fortified; but the consequent works could not have been of much importance, or were only of a partial character, since they did not

* "The four wheels of Charles's wain—
Grenville, Godolphin, Trevanion, Slanning—slain."

prevent the burning of Briton Side by an invasion of Bretons in 1404. Immediately after this steps were taken to place the town in a more defensible position; a wall was built, and the old castle on the Hoe, from which Castle Street takes its name, erected, Bishop Stafford of Exeter interesting himself in the undertaking. From time to time other fortifications were provided, indulgences being granted by Bishops Lacy and Vesey, following Stafford's example, to those who assisted; and a battery was raised on Drake's, then called St. Nicholas, Island. The alarm created by the Spaniards in the closing years of the sixteenth century led the townsfolk, headed by Drake, in 1590 to ask help from the Crown. Their letter states: "The towne is open to the enemy, and not defended by any fort or rampier." There certainly, however, was a wall before this, for we find prior allusions to gates; moreover, the Castle had been kept in repair. As one result of the letter, certain batteries on the Hoe were methodised into a regular fort, and plans were drawn by one Richard Adams for carrying a wall round the town from the old castle to a quay on Sutton Pool belonging to Mr. Sparke, the whole circuit being 380 perches. This left out the eastern side of Sutton Pool. Dues on pilchards, and other grants, were made by Elizabeth for the purpose. The fort was built; but in the building of the wall there was great delay, and it is doubtful whether it was ever completed. If so, this would explain the phrase of the order, "erecting and lengthening." It is probable, however, that the last word has reference to work done near Sutton Pool. Adams would naturally commence to build from the Castle; so that the eastern part of the wall would be the last undertaken. Moreover, we have to account for the facts that there stood between Bilbury Street and what was formerly known as Briton Side, exactly on a line with the western shore of Sutton Pool, and having no connection with the general line of circumvallation, what was called Martyn's Gate; and that Friary Gate, which crossed Exeter Street at Friary Street, could not have formed part of the completed defences. My suggestion is that the Friary Gate was included in Adams's original design, since we know from his own words that he left the Friary outside his wall; and that when the Corporation in 1643 set about lengthening the wall, they did so by extending it to Coxside proper, including the Friary. There is a corporate record that a gate at Coxside was set up in 1589, and ordered to be closed every

night. We can hardly have a doubt that this was the Friary Gate. The order that it was to be shut clearly shows that there must have then been some sort of a wall. Martyn's Gate is a difficulty. My only suggestion is that it at first formed part of the defences erected in the fifteenth century after the descent of the Bretons. The wall in its complete state ran from Coxside round Friary Gardens, across Whitefriars (now Tothill) Lane, thence to the head of Gasking Street; nearly east and west through the gardens behind Hewer's Row, by the north side of Ham Street, through the gardens on the south of Park Street, to the head of Old Town Street just below Drake Street; across what is now the Market, to the Globe Hotel; thence through Westwell Street churchyard and across Princess Square to the head of Hoe Gate Street, and so round the Castle to Sutton Pool at the Barbican.

Clarendon, in the passage cited, speaks of the strength of the town seaward. This could hardly have arisen from the number of cannon. In 1624 the fort only contained fifteen serviceable guns, and Drake's Island 20; and as the expenditure required to make the works efficient was put at £444 4s. 8d., it is not likely that much had been done in the interim. Here, therefore, the defenders of Plymouth had little to rely upon; the wall they had in part to build, and what saved them was "the weak and irregular line of earth," with its subsidiary works. The garrison seized with great skill the natural advantages of the place. The defence from sea attack was easy; the wall sufficed to guard against a sudden assault, but by itself could never have sustained a siege. Plymouth owed its safety to the fact that it stood upon a peninsula. Stonehouse Creek then reached nearly to the Cemetery. The unembanked Laira extended up to Lipson. Thus the waters of the sea formed a natural moat on all sides, save where the low-lying isthmus of Mutley gave access to the main land. Here was the centre of the outer works of defence. A strong redoubt was erected on Maudlyn,* now North Hill; and from it to the right and the left there stretched along the ridge a breastwork terminated by redoubts above Lipson and at Eldad, and having intermediate works at Holiwell (near the Prison) and Pennycomequick (the end of Cobourg Street). This line may seem rather extended, but the upper parts of Stonehouse and Lipson Creeks were easily

* Mutley is a corruption of Maudlyn, in its turn derived from the Magdalen or Leper House, which centuries since stood at North Hill.

passable at low water, and these weak portions of the natural fosse required almost as much protection as the open ground of Mutley. Then there were detached works at Stonehouse and Lipson Mill, intended to guard against flank attacks; and a very important redoubt across the Cattewater, known as Mount Stamford. Its special object was to secure the free use of the harbour, and it commanded the entrance of Sutton Pool. These walls, and breastworks, and redoubts seem very poor affairs in days of Breakwater Forts and Woolwich Infants; but we must judge them by the times in which they were erected; and the best proof that they suited these is that with a few additions they preserved the town during a nearly four years' Siege. When operations commenced, the outworks were very defective; and so far from being connected that the enemy could in many places approach within the line without molestation. There are indications that the existing hedges were utilised as far as possible, and New Work was apparently added to the line as first drawn, to command Mill Bridge.

The maps which accompany this paper, to a certain extent conjectural, are based upon the best authorities extant, and can be erroneous only in small matters of detail. In the main, they may with confidence be accepted. The map of the town is founded on the oldest trustworthy plans in existence, which reach up to within eighty years of the Siege period, checked and corrected, so far as the streets are concerned, by the records of building operations which have been handed down, and by the positions of the older houses yet remaining. The general outline of the walls is taken from a sketch map of Plymouth and its defences, which formed an appendage to the chief Siege tract, published in 1644, and which has been several times reproduced. It will be found in close facsimile in my "History of Plymouth." It makes, however, no pretensions to strict accuracy, nor was it drawn to scale; and whilst accepted as indicating the general character of the circumvallation, has been interpreted by the aid of such portions of the wall as yet remain, or the position of which is distinctly known.

The other map presents as accurate a view as is now practicable of the whole system of defence in its most complete and extended state, which would be somewhere about the latter part of 1645. To this there is one exception. Mount Stamford then, as a work of defence, had ceased to exist, and Mount Batten had become a more important fortification than represented. As we have no

means of knowing the exact character of the latter, I have adhered to the form elsewhere given. There was likewise a guard at Mount Wise. We can fix the position of the outworks with near approach to full accuracy from the traces which still remain, or which existed down to a recent period. The sketch map of 1643 supplies the names of the chief works; but two others are mentioned towards the close of the Siege, which we can only locate conjecturally. These are Little Pennycomequick Work and Little Maudlyn Work. From the discoveries of tobacco-pipes and other relics on the site of Houndiscombe House, there can be no doubt that the former stood there. Little Maudlyn Work I am inclined, from the configuration of the ground, and the fact that the spot was once occupied by a work belonging to the besiegers, which caused great annoyance to the Roundheads, to place on the brow of the hill to the immediate N.W. of Maudlyn. The levels and contours of the Ordnance Survey have greatly aided in defining the old water-line; and I have dotted in the courses of some of the chief modern thoroughfares exterior to the old town. In both maps the defences, for the sake of clearness, are drawn upon a larger scale than the general plan.

There were a few points of defence which are not indicated in either map. We find in the Siege Accounts, to be referred to hereafter, references to three half-moons at Gasking Gate, and to another at the New Gate by the Friary, for raising which, in May and June, 1645, seven boat-loads of stones were brought. These half-moons were ∧ shaped works, pointing towards the enemy. The greater part of the wall was of slate—certainly the older portions. A fragment remains behind one of the houses in Ham Street, and there is a portion worked into the wall of the court-yard of a house adjoining the site of Gasking Gate. Recently [April, 1875] nearly the whole of a much more important section has been removed, in connection with the construction of the Friary Station of the South-Western Railway. Though generally regarded as the wall of the Friary Grounds, the wall in question, marked with a star in the map, was evidently a part of that built under the corporate order of 1643. It was of stone from the ruins of the Friary, partly raised on slate foundations, about 10 feet high on the exterior, averaged two feet thick, and had a bank cast up against it on the inner side, with a walk, whereon the garrison used to take their stand. The whole wall was probably terraced

in like manner. The gates, the openings of which were 12 or 13 feet wide, were approached from the exterior by drawbridges; but it is doubtful whether a trench completely surrounded the town. Entries in the Siege Accounts show, however, that in order to guard against chance possession by the enemy of the east bank of Sutton Pool a trench was made from the Friary Gate to the East Gate along the margin of the Pool, and filled with water. There are entries of payments to Mr. Thomas Crampporne for "sleauseing ye Trenches between Fryrey Gate & ye drawbridge." The drawbridge can only be that at East Gate, and without such a trench there would have been nothing to prevent an enemy, embarked on Sutton Pool, landing on a perfectly open piece of ground within the walls. The gates were strongly defended. In August, 1645, one Matthew Stanley built a house over the sally-port at the Old Town drawbridge; and in January following Ludowick Stitson built a new guard-house at Frankfort. The chief magazine was in the Castle, but houses were hired for temporary magazines near the walls. Part of the Castle still remains at the bottom of Lambhay Street.

The outworks were of earth, and in their most complete form were stockaded. Most of them were of triangular outline. The cannon were mounted on wooden platforms, the provision of which formed no small item in the expenditure. Possibly an entry of payment for "threshells with ringes and swivells for the out-works" refers to something connected with these platforms. At the principal outposts there were horse guards. The breastwork was merely a low rampart and ditch.

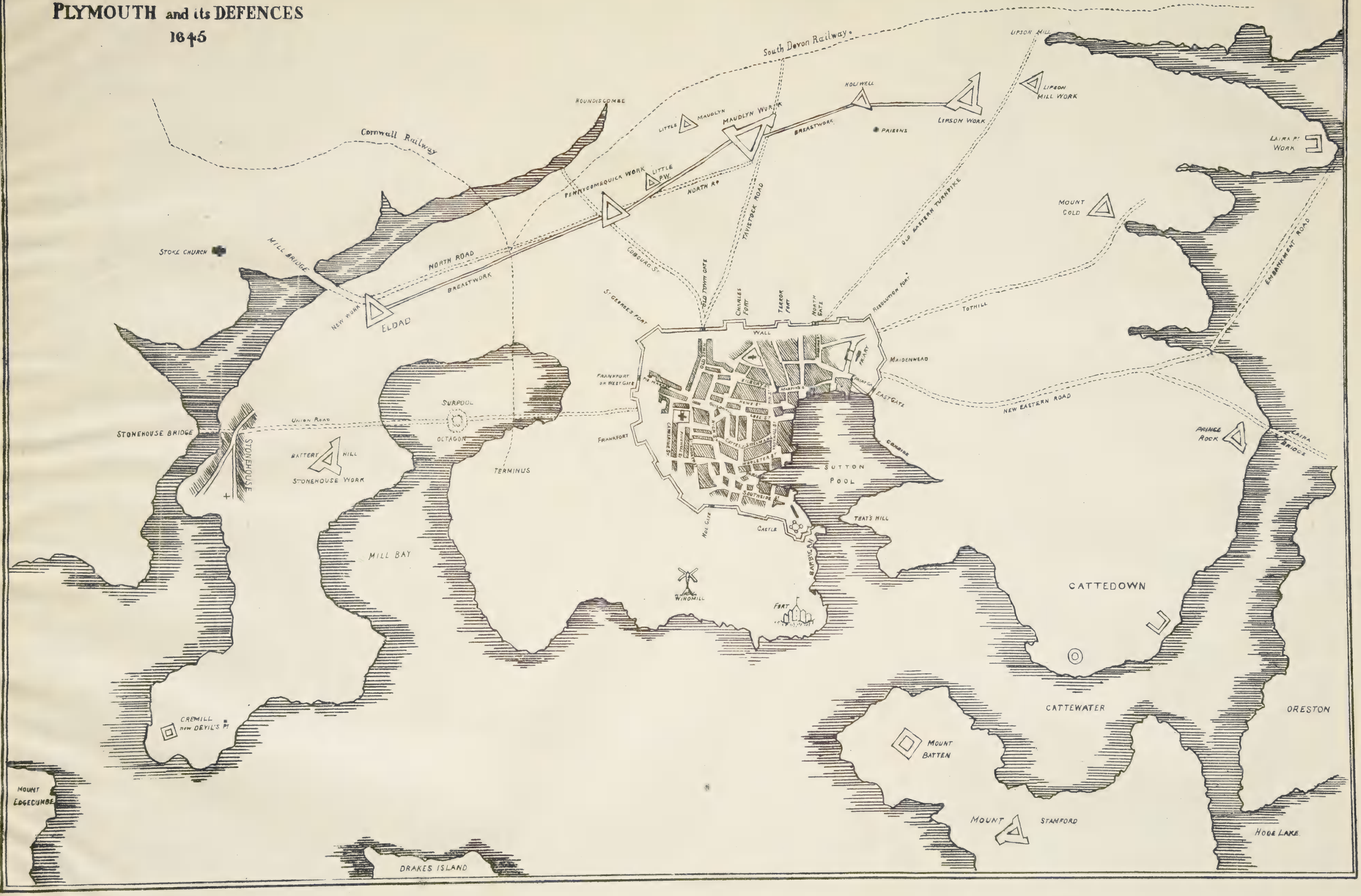
I now return to the history of the progress of the Siege.

The next attack was made about the middle of August by Col. Digby, who with 600 horse and 300 foot formed his head-quarters at Plymstock, and for five or six weeks so scoured the country that no provisions could be brought in. But the chief troubles of the town just then were internal. Sir Alexander Carew, commander of the fort and island, was discovered in communication with the King's army. Clarendon* says he was in treaty with Sir John Berkeley; Rushworth, that he held intelligence with Col. Edgcumbe and Major Scawen by night.† Mayor Francis, however, was a man of decision; and the treachery of a servant supplying all the evidence required, Sir Alexander was apprehended and sent to

* Vol. ii. p. 594. † Part 3, vol. ii. p. 796.


PLY
LIPSON HILL
LIPSON WORK
LIPSON MILL WORK
LAIRA Pt WORK
OLD EASTERN TURNPIKE
MOUNT GOLD
EMBANKMENT ROAD
TOTHILL
NEW EASTERN ROAD
PRINCE ROCK
LAIRA BRIDGE
CATTEDOWN
CATTEWATER
ORESTON
MOUNT BATTEN
MOUNT EDGECUMBE
MOUNT STANFORD
HOOE LAKE

PLYMOUTH and its DEFENCES
1645



London. He denied the treason, was reprieved for a while on the application of his wife, and at length was executed on Tower Hill, December 23rd, 1644. When voting for the execution of Strafford, he told Sir Bevill Grenville: "If I were sure to be the next man that would suffer on the same scaffold with the same axe, I would give my consent to the passing of it." It was with the same axe that he was beheaded.* Among the witnesses against Carew were Mr. Francis, two ministers named Willis and Rundall, Capt. Hancock, John Deep, merchant, and Arthur Skinner. Carew's own soldiers are said to have taken him in the very act of attempting to introduce Royalist soldiers into the island. The probability is that he was one of those who thought that the conflict was being carried beyond what had been intended or needed when it commenced.

Exeter surrendered to Prince Maurice on the 4th September; and Clarendon holds that if Maurice had then marched directly upon Plymouth, it would have yielded at his approach,† such was the discouragement the loss of Exeter caused, and so little was the town provided to sustain an attack. Maurice resolved to take Dartmouth on his way, having all the disinclination of the old school of generals to leave even a weak enemy in his rear or on his flank; and the Parliament took advantage of the consequent month's delay to send 500 or 600 soldiers by sea from Portsmouth to Plymouth, under Col. Wardlaw—appointed commander-in-chief of the town—and Col. Gould. Passing Dartmouth, they left 100 men there, and came on to Plymouth with the remainder. This addition to the garrison made the place secure. The mayor, according to Clarendon, was in no very good heart; while the inhabitants were afraid they would lose their trade and become only soldiers. Col. Wardlaw, however, took the defence of the town vigorously in hand.

We have seen what the defensive works were—the unfinished wall; the partially-connected outworks of Lipson, Holwell, Maudlyn, Pennycomequick, and Eldad; the detached works at Mount Stamford, Laira Point, Stonehouse, and Cattedown. Our materials for arriving at the strength of the garrison which manned them are scanty. In 1740 the population of Plymouth is said to have been 8,400. A hundred years previously it could not have

* Dugdale, "Short View of the late Troubles," p. 198.

† Vol. ii. p. 590.

exceeded 7,000, and in all likelihood was nearer 6,000. For this opinion there are several reasons. There had been a plague in 1625, the effects of which must have been still apparent. The registers of St. Andrew, then the only church in the town, show that the normal death-loss, excluding Stonehouse, which was considered part of the parish, did not exceed 200 yearly; which at a death-rate of 30 per thousand would give us rather under 7,000. Moreover, there is extant an assessment to the poll-tax of Vintry Ward about this date, which included all the inhabitants above 16. These were about 1,000 in number, which would make the total population of the ward 2,000. There were then only four wards, and of these Vintry was the most populous and important (it is now the smallest). So we are again brought back to an estimated population of 6,000 or thereabouts.* We may thus form some idea of the strength of the garrison at this period. The trained band of the town, if it included all the males capable of bearing arms, would muster about 1,500; but we may take it, I suppose, at about half that number.† The soldiery could not have been very numerous, or the addition of 500 would not have been thought of much consequence.

We fortunately possess a tolerably full record—the work of men who took part in the transactions they describe—of the progress of the Siege from the 15th of September, 1643, for nearly twelve months; and it is just this portion of the Siege with which the public are most familiar—the earliest of the Siege tracts, in which the narrative of Maurice's first unsuccessful attempt is contained, having been more than once reprinted.

Wardlaw soon undertook offensive operations. 150 of the new arrivals were turned into cavalry by the simple process of mounting them on horseback; and on the 8th of October 300 men crossed Cattewater under cover of the night, and at break of day surprised

* The relative positions of the four wards in population and wealth is shown very clearly by the amounts levied in poor-rates. In the year previous to the commencement of the Siege (1642) the total poor-rate of the borough was £204 15s. Of this Vintry Ward alone contributed nearly half, £90 3s. 1d.; Venour Ward, £37 15s. 2d.; Old Town Ward, £38 19s. 4d.; and Looe Street Ward, £32 7s. 5d.

† An order directed to the Mayor of Plymouth in October, 1617, orders that "persons of worth and quality be inrolled in the trayned bands." If this rule was adhered to, the bands must have been more select than numerous.

and routed Digby's guard at Hooe, taking 54 prisoners, some powder, and a pair of colours, with the loss of only two men. Dartmouth soon fell, and the garrison learnt that Maurice, with his whole strength, was on the march against them. Willing while they had the chance to strike another blow, they made a sally against a guard at Knackersknowle, and captured 20 or 30 of the men. The enemy rallied, and were reinforced from Roborough Down, and fifteen of the garrison, who had pushed too far in advance, were captured, the only one who escaped being Major Searle, who gallantly charged through his opponents.

The town was soon hemmed in. Maurice had five regiments of horse, and nine of foot, stationed at Plymstock, Plympton, Tamerton, Buckland Monachorum, Mount Edgcumbe, Cawsand, and elsewhere, his head-quarters being conveniently placed at Widey. The garrison were deceived by the Cavaliers bringing thirteen fishing boats overland from the Yealm into Pomphlett Creek. This was interpreted to indicate a design upon Cattedown, and the little redoubts and breastworks there were strengthened. But the besiegers knew their business better. In the night of the 21st October they raised a square work within pistol-shot of Mount Stamford, and commenced regular approaches to cut it off from all relief. It cost the Stamford garrison three hours' hard fighting before the work was taken, and in it fifty prisoners, under one Captain White. The capture was garrisoned by thirty musketeers, under the command of an ensign; but in the night the enemy fell on again, and ensign and men decamped without warning the fort.* Next morning there was a yet more desperate struggle. The Royalists brought up reinforcements, and it was not until the leader of the Roundheads, Capt. Corbett, had been shot in the forehead as he was encouraging his men to fall on, that the coveted spot was regained. This day cost the garrison 20 men killed, and over 100 wounded beside officers, Col. Gould among the latter. The besiegers certainly an equal number, including six commanders of rank.

This time the work was destroyed, and Mount Stamford strengthened by slight outworks—a breastwork on each side, terminated by a half moon, along the ridge—which were manned as well as the smallness of the force at hand permitted. The Cavaliers gave no

* This was regarded as either treachery or cowardice, and on the 8th November—a few days afterwards—the ensign was shot.

rest. Daily there were assaults and skirmishes; and on the 3rd of November batteries were raised within pistolshot of the fort, which, on the 5th, began to play, discharging on that day upwards of 200 demi-cannon and whole culverin shot, beside the shot of smaller guns.* These batteries completely commanded Mount Stamford, and flanked the outworks from Oreston Hill. On the first day several breaches were made in the fort, and the lieutenant and some gunners slain. The ramparts were repaired during the night, but there were serious needs that could not be easily supplied. Provisions and ammunition alike ran short; and no reinforcements came to relieve the garrison, who had been continuously fighting for eight days. They held out under another battering until noon of the next day, Sunday. The outworks then fell to a general assault; and the captain of the fort having sustained three further attacks, having only seven serviceable men left out of thirty-six, no provisions, and very little ammunition, and having made a signal of distress unavailingly for two hours, during which he kept the enemy at bay, surrendered on good terms, marching off with colours flying, bag and baggage, the best gun—a demi-culverin—in the work, and exchange of prisoners. If defeated, therefore, he was not disgraced; though the townfolk who did not come to his aid are called both faint and false-hearted.

So fell Mount Stamford. Its capture was the first and only advantage gained by the Royalists during the protracted and often revived Siege. It cost nearly three weeks independent leaguer, and some scores of lives, including four or five Cavalier captains, rumour magnifying the loss of the besiegers to a thousand. While its capture did credit to the energy of the Royalists, its surrender was no discredit to its immediate defenders. Its importance proved to have been monstrously exaggerated. The Royalists thought it the key to the position; and on its capture demanded the surrender of the town.

"That you may see our hearty desire of a just peace, we do summon you in his Majesty's name to surrender the town, fort, and island of Plymouth, with the warlike provisions thereunto belonging, into our hands for his Majesty's use. And we do hereby assure you, upon the power devised to us from his Majesty, upon the performance of a general pardon for what is past; and engage ourselves upon our honour to secure your persons and

* A demi-cannon carried a 24 lb. ball, a culverin 18 lb., a falcon 6 lb., a saker 5 lb., 6 lb., or 8 lb, a drake 6 lb.

estates from all violence and plunder. We have now acquitted ourselves on our parts; and let the blood that shall be spilt in the obtaining of these just demands (if denied by you) be your guilt.—Given under our hands at Mount Stamford the 18th day of November, A.D. 1643.—John Digby, Thomas Bassett, Peter Killigrew, John Wagstaffe, J. Treleany [Trelawny], R. Prideaux, John Arundell, Thomas Marke, William Arundell, John Downing, Thomas Stucley."*

The townsfolk were seriously inclined to comply. Col. Wardlaw was of a different mind. He in the alarm and confusion seized the fort and island, determined that if the town surrendered these strengths should still be held. Some such strong measure was needed. The neutralists who desired surrender were no feeble folk in numbers, whatever they were in mind. Moreover, both town and garrison were very ill-provided. A letter written from Plymouth to one Capt. Joseph Vaughan, a month before (October 27th), states that affairs were then all at sixes and sevens, and that men and money were both wanted; 1,000 men and £5,000 being of more service at that juncture than 20,000 men and £100,000 if the town were lost. Commander Wardlaw and Mayor Cawse had to face a desperate state of affairs; and to guard against treason, ever lifting its head, care was had to certain suspected deputy-lieutenants.

It was soon seen that the loss of Mount Stamford was rather a gain. Of little use in itself as a protection to the shipping—which, because of the enemy's cannon at Oreston and Mount Edgcumbe, had to shelter in Millbay—its maintenance would have drawn too heavily on the small strength of the garrison. Moreover, very little damage was done by the Cavalier cannon at Stamford, beyond shooting off a vane of the windmill on the Hoe, which was quickly new grafted, and injuring a woman in the arm. The final result, in the words of the old soldier-pamphleteer, was, "The town, which before was altogether divided and heartless in its defence, now grew to be united, with a resolution to stick by us in the defence thereof; partly out of fear, knowing that the fort and island would be goads in their sides if the town should be lost; but especially from their assurance of our intention to defend the town to the last man, by securing of those four deputy-lieutenants whom they suspected, and by the many asseverations and resolutions of the officers that they would, when they could

* Most of these commanders, it will be seen, were Cornish.

defend the town no longer, burn it to ashes rather than the enemies of God and of His cause should possess it; which resolution of theirs they confirmed by joining in a solemn vow and covenant for the defence of the town."

This vow and covenant, ordered to be taken by all in the town, ran thus:

"In the presence of Almighty God I vow and protest that I will to the utmost of my power faithfully maintain and defend the towns of Plymouth and Stonehouse, the fort and island, with all the outworks and fortifications to the same belonging, against all forces now raised against the said town, fort, and island, or any part thereof; or that shall be raised by any power or authority whatsoever, without the consent of both Houses of Parliament. Neither will I by any way or means whatsoever contrive or consent to the giving up of the said town and fortifications aforesaid, or any parcel of them, into the hands of any person or persons whatsoever, without the consent of both Houses of Parliament, or of such as are authorised thereunto by them. Neither will I raise or consent to the raising of any force or tumult, nor will I by any way or means give or yield to the giving of any advice, counsel, or intelligence to the prejudice of the said town and fortifications, either in whole or in part, but will with all faith fully discover to the Mayor of Plymouth, and to the Commander-in-Chief there, whatsoever design I shall know or hear of hurtful thereunto. Neither have I accepted any pardon or protection, nor will I accept any protection from the enemy. And this vow or protestation I make without any equivocation or mental reservation whatsoever, believing that I cannot be absolved from this my vow and protestation, and wishing no blessing from God on myself or my posterity if I do not sincerely and truly perform the same. So help me God."

An attempt was made when Stamford fell to retain a hold on the south of Cattewater by raising a fort upon Mount Batten, then called Haw Start (Point). Hitherto the garrison of Mount Stamford retreated, but as the townsfolk would not go to their aid, and they were wearied almost to death, they came back to Plymouth. Haw Start was then fortified by the Cavaliers. It takes its present name of Mount Batten from an officer who was subsequently concerned in raising the chief work there. On the same day that Mount Stamford was taken Lipson Work was assailed, but without success; and possibly this was but a feint.

The townsfolk had a solemn day of humiliation, took their vow and covenant, and, in the spirit of the Cromwellian saying, "Put your trust in Providence, and keep your powder dry," proceeded to complete the rampart and ditch connecting the five great outworks, which were yet in a very unfinished state. Between the

6th and the 16th of November nothing of note occurred except a foraging sally at Thornhill, which ended in the capture of Major Leyton, because, as in the assault on Knackersknowle, the party pushed forward too far. The Lipson end of the line was the first attacked. The deep valley, however, prevented the Cavaliers from raising their battery (which opened on the 18th November) near enough to do much damage. Though the townsfolk were by this time both united and determined, they were not thoroughly purged of the leaven of malignity. Three notorious "malignants" were among them—Ellis Carteret, sailor; Henry Pike, vintner; and Moses Collins, attorney. Carteret endeavoured to induce Roger Kemborn, chief gunner of Maudlyn Work, to blow it up. Kemborn revealed the plot, "God not suffering his conscience to rest until he did;" and Carteret was apprehended. Pike and Collins fled to the enemy.

Sunday, the 3rd of December, 1643, is one of the most memorable days in the history of Plymouth. Never stood the town in such peril. Its fate trembled in the balance; and if train-bands and soldiers had not alike done their duty, the Parliament would have lost its last stronghold in the West. There was a small breastwork at Laira Point, just at the junction of what then was Lipson Creek with the Laira. It was but an entrenched outpost with three cannon, and in itself of little strength. Low tide fell during the dark hours of the morning of the 3rd December, and Lipson Creek, save the middle channel, was dry. Guided by Pike and Collins, 400 musketeers crossed the mud, wading the stream a little below the mill; and following down the western shore under cover of the precipitous banks, surprised the guard at the Point. It then wanted three hours to sunrise. The guard were not so completely surprised but that the alarm was given to the garrison; and at daybreak, 150 horse and 300 musketeers fell in above Tothill to repel the attack. The ridge concealed them from the main body of the besiegers; but as they were in full view of Mount Stamford, a warning shot fired thence aroused Prince Maurice and "all the gallantry of his army," who immediately advanced in full strength from Compton and Egg Buckland down Lipson Valley, under cover of their ordnance and sheltered by a hedge, to the support of their forlorn hope. Speed as they would, the Roundheads were before them; and by the time they arrived, a hot conflict was onward near the Point. The besiegers' supports

turned the scale. The Roundheads were outnumbered ten to one, and driven back in absolute rout for the space of three fields. So hasty was the retreat, and so hot the pursuit, that some of the Cavalier horse pushed on past the outworks to within pistolshot of the walls, and were there either killed or taken. The bulk of the Roundheads, however, rallied on the highest point of Freedom Fields, their left flank protected by Lipson Work. Here they were reinforced from the different outworks, though the aid was small. There was great danger of assault elsewhere; Pennycomequick Work indeed was attempted, though without success; and few could be spared. Weak as they were, they held their ground for hours of anxious expectancy, during which the Cavaliers were either unable or afraid to follow up their advantage. At length they summoned Lipson Work, probably the obstacle. Their trumpet was answered by a cannon, and this shot heralded the re-commencement of the battle. A drake was brought up, planted in a position of vantage, and discharged several times on the enemy's horse with good effect. The field party were reinforced by a couple of hundred of the train-bands. Sixty musketeers were sent round under Mount Gould to take the enemy in the rear. And at a signal given by sound of drum, a general assault was made along the whole line (for so I interpret the order that the several commanded places should fall on). The enemy gave way. Their retreat, followed up, became a rout. Down the hill they rushed pell-mell, in far too much of a hurry to choose a path; and while making their hasty way over the creek, some were killed, and still more captured. Their rear guard of cavalry, cut off, was forced into the mud in utter confusion. Many of the horses were drowned; some of the horsemen made their escape by crawling on shore; not a few were killed by the cross-fire of the pursuing horse and foot, and of some vessels stationed at Laira Point, which had parleyed with the enemy while the issue of the day was doubtful, but when the retreat commenced, became honest again. These vessels in all likelihood were some just sent by Parliament to the town's relief. The repulse was complete, and the town was saved. Both sides suffered heavily. The garrison, when they were driven back, lost forty-three officers and men prisoners, Captain Wansey and twelve men killed, and a hundred wounded, some mortally. The loss of the assailants was much greater. The boasting shouts of the Cavaliers, "The town is ours," had been answered by the hopeful cries of the garrison,

"God with us." And when in the event, to quote the words of the old chronicler, the Lord showed himself so wonderfully in their deliverance, soldiers and townsfolk united in a solemn day of thanksgiving, proclaiming their confidence in the noble motto, "Turris fortissima est nomen Jehova."* For many a year the bells of St. Andrew rang joyous peals each 3rd of December in memory of the great mercy of this "Sabbath-day fight." It was indeed a great deliverance. If the Royalists had held possession of their ground that night they would have gained Cattedown. Then the garrison would have had to betake themselves to the wall; and as that was not finished, a very few hours would have settled the fate of the town. No wonder that Major-General Basset called from the trenches to one of the Roundhead officers that he verily thought God fought against the Cavaliers.

The next three weeks were tolerably quiet, the only episode being a night attack upon the small redoubt near Lipson Mill, then newly raised. On the 18th of December a bombardment commenced, but it had little success. To make the attack more effective, the batteries were approached so close that they were commanded by the outer earthworks; and the Cavalier gunners were beaten from their guns. A more serious danger soon threatened. On the night of the 20th December, under cover of the darkness and the rain, aided by the carelessness of the captain at Maudlyn, who neglected his sentries, the besiegers contrived, with the help of a corner of a field, to raise a square work within pistolshot of Maudlyn, endangering the communication with the work at Pennycomequick. At daybreak this was discovered; and, anxious to repair their neglect, the garrison at Maudlyn, threescore strong, made an attack. They found that the new work was held by a force four or five times their number, and were driven back. All the available men from the town were then brought up, both horse and foot, and at nine o'clock the attack was renewed. The first assault was repulsed; at the next the assailants made a footing in the work, to be immediately driven out again. But they were not daunted. The reserves were brought

* Was not this motto adopted about this time? and is it not itself a relic of the Siege? I cannot answer the question certainly; but infer as much. The earliest occasion of its use with which I am acquainted is as the legend of a small seal with the borough arms, used by the Mayor immediately after the Siege period.

into action. Again they fell on, and this time succeeded, driving the Royalists pell-mell before them, and being held back with difficulty from assailing their batteries. The work was then destroyed. What it cost the garrison we have no means of knowing; but as nearly 100 Cavaliers were slain, the loss of the stormers must have been severe.

The effect of this blow was such, coupled with the fact that fever had broken out in the camp, many soldiers falling victims,* that on Christmas-day, the date by which Maurice said the town should be taken, the Siege was raised; the Prince as a parting shot issuing an order to the constables and tything-men of Egg Buckland and St. Budeaux against the relief of the garrison:

"Forasmuch as divers persons disaffected to his Majesty's service make their daily recourse into Plymouth, furnishing the rebells there with all manner of provision for man and horse, contrary to his Majesty's proclamation prohibiting the same; these are therefore to signify that if any person, of what degree or quality soever, presume to have any commerce or dealing with any in the said town, or take or carry with him any horses, oxen, kine, or sheep, or other provision for man or horse, into the said town of Plymouth for the relief of the rebells there, every such person and persons shall be proceeded against, both in person and estate, as abettors of this horrid rebellion and contemners of his Majesty's proclamation, according to the limitation of the Court of Wards in such cases provided: willing and requiring all mayors, justices of peace, bailiffs, constables, and all other of his Majesty's officers and ministers, to cause them to be forthwith published in all churches, chapples, markets, and other places, whereby his Majesty's loving subjects may the better take notice thereof.—MAURICE."

It was time for some relief. The privations of the inhabitants had been severe, and their death-rate had risen very high. The registers of St. Andrew, which deal only with the actual burials in the churchyard, show that in December alone, instead of the 18 or 20 which would have been a fair average for that time of the year, there were 132. Provisions had been very scarce; and it is acknowledged with devout thankfulness, that when the poor people were grievously punished, "there came an infinite number of pilchards into the harbour within the Barbican, which the people took up with great ease in baskets, which did not only refresh them for the present, but a great deal more were taken, preserved and salted, whereby the poor got much money." Another providential occurrence was the fact that the day after the Siege was raised, instead of earlier, part of two of the works fell down.

* WHITELOCK, "Memorials," p. 75.

The train-bands had done their duty well; and perhaps it is to this period of the Siege that we must refer a tradition preserved by Mr. John Fox in his MSS.,* the death, while defending Maudlyn Work, or in Maudlyn fields, of one Smith, a silversmith, an ancestor of the Collier family. A relative was going up to the work with his dinner, when he or she met his body bringing back, headless, thrown across a horse like a sack. The idea of taking out dinner to the combatants may seem strange; but we have a special record of "the great humanity of the good women of Plymouth, and their courage in bringing out strong waters and all sorts of provisions, in the midst of all our skirmishes and fights, for the refreshing of our soldiers, though many women were shot through the clothes." The credit of the defence is not confined therefore to the sterner sex, and the pluck of the women must have helped to compensate for the deficient numbers of the men.

The garrison were deficient of munitions as well as men; but they had one piece of good fortune. When they were most pressed for money, Sampson Hele, of Fardel, came informally, without drum or trumpet, with a summons of surrender; whereupon, by way of ransom, he was "persuaded" to yield £2,000 for the payment and clothing of the soldiers.

When Maurice left, the Siege was turned into a blockade under the charge of Digby. Mount Stamford was retained, but the head-quarters were at Plympton, whilst a strong force was quartered at Tavistock. Moreover, the Cavaliers of Devon and Cornwall entered into a solemn vow and protestation, to the utmost of their power to assist his Majesty's armies in reducing Plymouth.

The chief commanders of the attack during this period were—Prince Maurice, the Earls of Marlborough and Newport, Lord Mohun, Sir Thomas Hele, Sir Edmund Fortescue, Sir John Grenville, Sir Richard Caire, Sir James Cobourne, Sir John Digby, Sir Peter Courtney, Sir William Courtney, Lieut.-General Wagstaffe, Major-General Basset. The officers of the garrison—Colonels William Gould, Michael Serle; Lieut.-Colonel William Layther; Nathaniel Willis, Sergeant-Major; Captains Samuel Bersch, Gabriel Bernes, Henry Potter, William Watton, Henry Plumley, William Hill, Thomas Hughes, Robert Northcote, Thomas King, George Hamilton, William Owen, Humphry Burton, Thomas Halsey;

* Preserved in the Cottonian Library.

Capt.-Lieuts. Bartholomew Henderson, James Moore; Lieuts. Philip Beaumont, Thomas Stayner, — Chaffin. Officers of the horse—Philip Francis, John White, Richard Evins, Arthur Gay, Richard Burthogg, Henry Hatsell. Captains of the town—Ellis Grimes or Crymes, Philip Crocker, Robert Harvie, Christopher Martin; Christopher Crocker, Captain-Lieutenant.

It must have been about this time that Wardlaw ceased to be active governor. He was succeeded by Gould. A letter from Wardlaw was read to the House of Commons on September 4th, 1644, in which it is stated that he had become incapacitated for service by infirmities incurred in the discharge of his duty.*

The town had a month's peace; but peace did not mean idleness. The breathing time was employed in strengthening and repairing the old fortifications, and in adding new ones. Not only were the enemy's redoubts and batteries slighted, but the hedges immediately contiguous to the outworks destroyed. This was more important than making sallies. Besides, the soldiers sorely wanted rest; for it had been a common thing for them to endure six or seven nights' duty without relief.

The month's peace consisted only in living free from actual assault. Mount Stamford daily favoured the town with some great shot, but they did little damage. Hostilities in the field were renewed on the 26th of January, when the Cavaliers at Plympton and Buckland fell upon some scattered parties of the garrison. Major Halsey, with the Roundhead horse, pursued and attacked the enemy at Tamerton. In February and March there were various sallies, which inflicted considerable annoyance on the besiegers, but had no effective result.

In one of these, Col. Digby was placed *hors de combat*, receiving a rapier wound in the eye, from which he never properly recovered.† The conduct of the Siege thus fell into the hands of Sir Richard Grenville, of whom more anon.

A little later death deprived the garrison of its commander, Col. William Gould, who held also the office of High Sheriff of Devon under the Parliament. The decease of this "noble and valiant gentleman" was improved by Stephen Midhope, one of the chaplains of the garrison, who, when publishing the sermon, dedicated

* State Paper Office. Domestic State Papers for that year.

† Clarendon, vol. ii. p. 806.

it to Sir John Bampfield, then commanding in the town. There is a singular uncertainty about the date of Gould's death. One of the Siege tracts places it on the 27th of March. The register of St. Andrew records the burial of Col. William Gould on the 9th July. When he died, the command of the town was put into commission, being granted (it would almost seem by Col. Wardlaw, possibly still the Governor in name, though incapacitated) to the Mayor, Col. Crocker, and Lieut.-Col. Martin, until a commander-in-chief was sent down from the Parliament; the two former subsequently transferring their authority to the last.

But this has carried us rather in advance of the course of events. On the 18th of March—Digby was wounded probably in a sally on the 15th—Grenville sent the following letter into the town:

For Col. Gold, together with the officers and souldiers now at the Fort, and Towne of *Plimmouth*, These

GENTLEMEN,

That it may not seeme strange unto you, to understand of my being ingaged in his Majesties service, to come against *Plimouth* as an Enemy, I shall let you truely know the occasion thereof. It is very true, that I came from *Ireland* with a desire and intention to look after my own particular fortune in England, and not to ingage myself in any kind in the unhappy difference betwixt the King and the pretinded Parliament now at *London*. But chancing to land at *Liverpoole*, the Parliament's forces there brought me to London, where I must confesse I received from both the pretended houses of Parliament great tokens of favour, and also importunate motions to ingage me to serve them, which I civilly refused: afterwards divers honourable persons of the pretended Parliament importuned me to undertake their service for the Government and defence of *Plymuth:* unto which my answer was, that it was fit (before I ingaged my self) I should understand what meanes they could and would allow and provide for the effectuall performance of that service; upon that a Committee appointed for the West thought fit with all speede to send a present reliefe of Men and Munition to *Plymouth*, which with very great difficulty was brought thither, being the last you had; afterwards there were many meetings more of that Committee, to provide the meanes that should give *Plymouth* reliefe, and enable it to defend itself, and notwithstanding the earnest desires, and endeavours of that Committee accordingly, I protest before God, after six moneths expectation, & attendance on that Committee by me, I found no hopes or likelyhood of, but reasonable means for the reliefe and defence of *Plymouth*, which made me account it a lost Towne, and the reather because I being by Commission Lieut. Generall to Sir *William Waller*, had an ordinance of the Parliament for the raising of 500 horse for my Regement at the charges of *Kent*, *Surry*, *Sussex*, *Hampshire*, who in 3 moneths time, had not raised 4 Troopes, and my own Troope, when I left them having 2 months pay due to them, could get but one month for which extraordinary means was used, being a favour none else could obtain,

it being very true, that the Parliament's forces have all beene unpaid for many months, in such sort, that they are grown weak, both in Men and Monies, and have by only good words kept their forces from disbanding. The processe of so long time spent at *London*, made me and many others plainly see the iniquity of their policy, for I found Religion was the cloak for Rebellion, and it seemed not strange to me when I found the Protestant religion was infected with so many independants, and sectaries of infinite kinds which would not heare of a peace, but such as would be in some kind as pernicious as was the warre. The Priviledges of this Parliament I found was not to be found by any of the former, but to lay them aside and alter them as they advantaged their party. This seemed so odious to me that I resolved to lay my self, as I have done at his Ma: feete, from whence and his most just cause, no fortune, terrour, or cruelty shall make me swerve, in any kind: and to let you see also what hath formerly past, I have sent you these inclosed. Now for a farewell; I must wish, and advise you, out of the true and faithfull love and affection, I am bound to beare towards mine own Country, that you speedily consider your great charges, losses, & future dangers, by making and holding your selves enemies to his Majestie, who doth more truly desire your welfare and safety, then it seemes you doe your selves, wherefore (as yet my friends) I desire you to resolve speedily of your Propositions for peace, by which you may soone injoy your liberties, contents, and estates, lest on the contrary, the contrary which with a sad heart I speake, you will very soon see the effect of. Thus my affection urgeth me to impart unto you, out of the great desire I have, rather to regaine my lost old friends by love, then by force to subject them to ruine, and on that consideration I must thus conclude. Your loving friend,

Fitzford 18 Martij. 1643. RICH. GRENVILLE.

To this the Garrison replied:

SIR,—Though your Letter meriting our highest contempt and scorne, which once we thought fit by our silence (judging it unworthy of an answer) to have testified, yet, considering that your self intends to make it publique, we offer you these lines, that the world may see what esteem we have of the man notorious for Apostacy and Trechery, & that we are ready to dispute the justice and equity of our cause in any lawfull way, whereto the enemy shall at any time challenge us. You might well have spared the giving us an account of your dissimulation with the Parliament. We were soone satisfied; and our wonder is not so great that you are now gone from us as at first, when we understood of your ingagement to us: & to tel you truth, it pleased us not so well to hear you were named to be a Governor for this place as now it doth to know you are in arms against us, we accounting our selves safer to have you an enemy abroad than a pretended friend at home, being persuaded that your principles could not afford cordiall endeavors for an honest cause. You tell us of the pretended houses of Parl. at *London*, a thred-bare scandal suckt from Aulicus, whose reward, or a Bp blessing, you may chance to be honoured wth for your Court-service; & how they make Religion the cloak of Rebellion, a garment which we are confident

your Rebellion wil never be clad with: You advise us to consider the great charges we have beene at, and the future dangers we runn our selves into, by making our selves enemies to his Majesty, who more desires our good than we our selves, & thus would have us prepare conditions for Peace. That we have bin at great charges already we are sufficiently sensible, & yet resolve that it shall not any way lessen our affections to that cause, with which God hath honoured us, by making us instruments to plead it against the malicious adversaries. If the King be our enemy, yet *Oxford* cannot proove that we have made him so. That his Majestie desires our wel-fare we can easily admit, as well as that its the mischievous Councellors so neere him who render him cruel to his most faithful subjects: & as for our proposing conditions of peace, we shall most gladly do it when it may advance the publique service; but to do it to the enemies of peace, though we have bin thereto formerly invited, yet hath it pleased the disposer of all things to preserve us from the necessity of it, & to support us against all the fury of the inraged enemy. The same God is still our rock and refuge, under whose wings we doubt not of protection & safety, when the Seducers of a King shall die like a candle, and that name which by such courses is sought to be perpetual in honor, shall end in ignominy. For the want of money to pay the Parliaments souldiers, though it be not such as you would persuade us, yet certain we are their treasury had now bin greater, and honest men better satisfied, but that some as unfaithful as your selfe have gone before you in betraying them both of their trust & riches. Whereas you mind us of the lost condition of our town, sure it cannot be you should be so truly persuaded of it, as they are of your personall, who subscribe themselves, and so remaine friends to the faithfull.

Grenville enclosed a book entitled the "Iniquity of the Covenant." This was burnt in the market-place (somewhere in Whimple Street, I take it), by the hands of the common hangman (then apparently a town official), by order of the Council of War. Moreover, a proclamation was made that all those who had any of these books, and did not bring them forth, should be held and dealt with as enemies to the State and Town.

Colonel Martin was a commander of decision and vigour. He acted upon the offensive, to prevent the enemy from taking up close quarters again; but the Cavaliers, as the year wore on, gradually drew their circle narrower. The garrison must have received some reinforcements. Our only definite information is the statements, that certain of the prisoners captured took the covenant and enlisted on the Parliamentary side; and (in a despatch by Martin himself) that men from all parts came in daily, but that there was no money to pay them.

Martin's earliest movement of importance was an assault upon St. Budeaux. Hearing that 500 Cavaliers were quartered there, he

sent against them 600 musketeers, with some horse, at the same time making a feint in the direction of Plympton, the besiegers' head-quarters. The attacking party were separated by a mistake of the guides. Nevertheless the foot fell upon St. Budeaux unobserved, captured the garrisoned church tower, and took a couple of officers and 44 other prisoners, besides powder, horse, and arms.

This was on the 16th April. On the 19th Martin beat up the enemy's quarters at "Newbridge on the way to Plympton," somewhere between Longbridge and Marsh Mills. Impetuous as usual, the forlorn hope, disobeying orders, fell on while the reliefs were yet a mile behind, beat the Cavaliers from hedge to hedge, and captured a breastwork in advance of the bridge; but at length, their powder being spent, they had to retire before the main strength of the enemy, two men only being wounded.

On the 21st of April an attack was made from Prince Rock upon the Cavalier guard at Pomphlet Mill, and prisoners and provisions brought in. This was but a small affair.

On the 11th of May a more formidable expedition attacked the enemy at Jump, then called the Jump, or Trenaman's Jump.* This sortie issued from Hopton's work—probably an old fortification of the besiegers, opposite Maudlyn. It consisted of 1,000 foot and 100 horse, 400 musketeers and 25 horse "making good the wayes about Compton" to prevent a flank attack. The enemy were beaten out of their quarters, and 100 brought back prisoners, despite attempts at rescue.

Colonel Martin then turned his attention westward. The *Mercurius Rusticus* contains a statement under date May 12th: "The rebels from Plymouth assaulted Mount Edgcumbe House in Cornwall (which was only defended by thirty musketeers), were bravely repulsed, and eighty of them killed in the place." While there is evidently some exaggeration in the roll of the slain, there is little doubt that this action really took place three days later—on the 15th of the month, when Colonel Martin sent Captain Haynes with 300 men from Cremill (now Devil's Point) to Mount Edgcumbe, himself following with 20 horse when the passage was open. On his arrival he despatched the following summons to Mount Edgcumbe, but without effect:

* May not the word be derived from the Cornish gump, a plain?

To prevente the Efusyon of Chrystian Blood I doe heerbye Require y^u^ ymediately to deliver Mount edgcumbe house unto mee for ye use of the Kinge & Parliamt And y^u^ shall have fayre quarter w^ch^ if y^u^ shall Refuse I have acquitted myselfe from the guilte of the Blood w^ch^ may be spilte in obtayninge my just desire ROBT MARTEN

Passage 15 May 1644

To the Governour of
Mount Edgcomb House: these.

The landing was effected at the Warren, near the Old Block-house yet standing in the gardens. Here were mounted three small guns, which used greatly to annoy the boats going to Stone-house. These were captured at the outset, the gunners retreating to the house. Finding that his summons produced no result, Martin left a party to watch the garrison, and pressed onward. Maker Church tower was assaulted and taken, and therein a barrel of powder. A fort at Cawsand was surrendered; Millbrook, entrenched and garrisoned by 250 men, was carried. A fort at Inceworth was abandoned on the approach of the victorious Roundheads. But the captures could not be held. The Cavaliers came down in force from their head-quarters on the Cornish side of the Tamar, at Saltash; and so Col. Martin retreated with his booty, which was considerable—12 pieces of captured cannon and 200 prisoners. On the road he assaulted Mount Edgcumbe, but was repulsed. The banqueting-hall and the out-offices were burnt, but the main building, being of stone, was not to be dealt with in that summary way. According to Col. Martin, the casualties in this affair were very slight; not a tithe of the eighty slain by the writer in *Mercurius Rusticus*. When the sortie returned it was learnt that the besiegers had attacked the outworks with 1,000 horse and foot, and been beaten back.

On the 22nd of the same month (May) Warleigh House was assailed, and fifty horses taken. This was not effected without loss; for the party were considerably harassed in their return.

Possibly there were other sorties. Whitelock mentions one in which forty prisoners, with horses, arms, and ammunition, were taken; another, wherein the garrison issued forth two miles, and captured 9 guns, 150 prisoners, 100 cows, and 500 sheep; a third, whence forty horses and prisoners were brought in; a fourth, resulting in 100 prisoners; and a fifth, in which fifty horses were captured, Capt. Arundel and other inferior officers, and many soldiers slain. How far these are to be identified with the forays already

detailed I have no means of saying; but in all likelihood some must be duplicate versions of the same event. Tonkin, the historian of Cornwall, supplies us with the additional fact concerning the last, that Arundel, who was the son of the gallant Governor of Pendennis, familiarly called "Old Tilbury" and "John for the King," was shot dead in the entrenchments by one Capt. Braddon.*

There were still troubles within the walls. A feminine malignant and traitor was detected holding correspondence with the enemy, and committed to the Castle. The articles against her were that she sent suits of apparel to the renegadoes Pike and Collins; that she discovered to the enemy the quantity of powder in the town; that she invited the enemy to assault it; and that she desired a Cavalier, Major Harris, to quarter in her house when the town was taken, informing him moreover that the Protestant religion in Plymouth was decayed and breathing its last gasp. There was another "virago," but she was allowed to "sleep for a while that her shame and doom might be the heavier."

From the *Weekly Account* of July 30th, 1644, we learn that Plymouth was well supplied with provisions: beef, 2½d. per lb.; cheese, coal, and meal, cheaper than in London. The chief wants were of money and river-water, though there were plenty of wells. The Cavaliers, therefore, must have cut off the leat.

Col. Gould had been an officer of the most approved Puritan type, purging "the forces from swearers, drunkards, and abominable livers, causing the town and garrison to be very careful in observing the Lord's-day and days of humiliation, and to be frequently present at the ordinances of the Lord of hosts." Col. Martin, we may presume, followed in his footsteps. So far as actual warfare was concerned, he was the most energetic and daring commander the town had. "Tough Old Plymouth" was now the only place in Devon and Cornwall that adhered to the Parliament. Beside it, Poole, and Lyme, the whole of the West of England was in

* Hals, the Cornish historian, says that James Hals, of Efford, was Lieut.-Colonel in Colonel Boscawen's regiment defending Plymouth. He was captured in a sortie, and sent prisoner to Lydford. Here some of his fellow-officers—Leach, Morris, and Brabyn [Brabant?]—were executed without trial for high treason by Grenville. Hals was spared, but kept in prison until, twenty months afterwards, Essex in his march into the West set the prisoners free. While in prison, Browne gave him a copy of his *Lydford Law* "for his diversion."

Royalist hands. The value of such a man as Martin in such a port as Plymouth is clear. Like his predecessors, Wardlaw and Gould, he succumbed to the service. The burial of Lieut.-Colonel Richard Martyn is recorded in the register of St. Andrew for October, 1644. Col. Kerr was the next commander. Martin, however, was still at the head of affairs when Maurice, early in July, made another assault; but being again unsuccessful, drew off, and once more left matters in the hands of Grenville.

On the 1st of this month an ordinance of the Lords and Commons, appointed Commissioners for the Western Counties for raising moneys for the maintenance of the army and garrisons there, and for other purposes. The chief care of this committee was the supply of Plymouth. At the head of the Commissioners for Cornwall was John Lord Robartes; and it was at his desire that Essex made his unfortunate march into the West,* Robartes believing and arguing that in this way great assistance would be obtained in his own county. Plymouth was greatly encouraged by the news of the Lord General's approach. As he drew near, Grenville, who had now only 500 foot and 300 horse,† retreated on Tavistock, abandoning all his positions. At Fort Stamford four guns were taken, and at Plympton eight; whilst at Saltash and a great fort—wherever that may have been—there were found more cannon and many arms. Essex, strengthened then or subsequently by 2,500 men from Plymouth, marched on into Cornwall by Newbridge.‡ Grenville's house at Fitzford was assaulted on the 23rd July, 150 prisoners made, and £3,000 worth of pillage taken. On the 26th the passage at Newbridge was forced, Essex losing 40 men against Grenville's 400.§ A regiment of Plymouth horse is recorded to have charged bravely. It does not add to our estimate of Grenville's qualities as a soldier, or to our opinion of his men, that Essex was able to effect the passage so easily. The sides of the gorge of the Tamar at Gunnislake are exceedingly steep, even precipitous, the river deep; and Grenville's force, if small, ought to have inflicted great loss on the assailants.

At this time some of the Parliamentary fleet were at Plymouth, as appears from the following correspondence, for a copy of which, with the summons of surrender already cited, I am indebted to

* Whitelock, p. 92.
† Clarendon, vol. ii. p. 807.
‡ Whitelock, p. 93.
§ Whitelock says 200.

the Earl of Mount Edgcumbe, among whose family muniments the originals are:

Robert Earle of Warwicke, Lord High Admiral of England, Ireland, and Wales, and Captain-Generall of his Ma^ties Seas and Navy Royall.

To ye Commander-in-Chiefe of Mount Edgecomb,—I doe hereby sommon you, in the name of the King and Parliament, forthw^th to render to mee Mount Edgecomb, now in yo^r keeping, for the use of his Ma^tie and ye Parliam^t w^th all things in it. Els you may expect the rigour of warre, I being resolved otherwise to enforce yo^r speedy obedience. You are to retorne mee yo^r answere by this Bearer, my Lieutennant. WARWICKE.

Aboord his Mat.'s ship the *James*, in Plimouth Sound, 30 July, 1644.

The answer is as follows:

NOBLE EARLE OF WARWICKE,—Wheras you have sumoned me, in the name of the King and Parliament, to Render unto yo^r Lord^pp the Howse Mountedgcombe; may y^tt please yo^r Honner, I am heere intrusted to keepe the Howse for my Master, Coll^ll Edgcombe, till his returne: to whom, as I conceive, itt doth justly belonge.

Your Humble Servant, HENRY BOURNE.

Mountedgcombe, July the 30th, 1644.

There is no need to recall the details of the disaster that befell Essex, the greatest blow, according to his own admission, that the Parliament had received.* The King and Prince Maurice marched after him. Richard Symonds, a Cavalier who was with the King, and whose diary we have, states that the joint armies mustered 10,000 foot, 5,000 horse, and 28 pieces of cannon. Essex was hemmed in at Boconnoc, the scene of Ruthven's disaster. Sir William Balfour, with 2,300 horse, broke through the investing line, and reached Plymouth by Saltash; Skippon, with the foot, including the Plymouth contingent, surrendered. Essex, with Lord Robartes, Sir John Merrick, and a few others, escaped from Fowey in a small vessel, contemptuously termed a cock-boat by the Cavaliers, to Plymouth.†

Every preparation was made at Plymouth to resist the coming attack of the Royalists, flushed with victory. Fortunately a quantity of supplies had been received which were originally intended for Gloucester. The breathing-time was brief. Skippon surrendered on the 1st September; by the 5th the King, with Maurice and Grenville, were at Tavistock, whence the latter sent

* RUSHWORTH, p. 703.

† Essex speaks very highly of the conduct of the Plymouth horse under Capt. Reynolds.—RUSHWORTH, part 3, vol. ii. p. 703.

a trumpeter summoning the town to surrender. The trumpeter, who according to Symonds "was abused and imprisoned," did not return until the next day, and then only with the message that the answer should be sent by one of the Roundhead drummers. All we know of this answer is that it must have been in the negative. On the 9th of the month (Monday) the army marched to Roborough, where they camped, and whence Sir John Campsfield, with the Queen's regiment of horse, was sent to demonstrate against the stubborn town; the only result being that when he returned the rebel horse followed him at a less respectful distance than was convenient. So on the Tuesday the army marched upon Plymouth, with drums beating and colours flying, and making, no doubt, a very gallant show in the eyes of the expectant Roundheads as they poured down, 15,000 strong, over the slopes of Mannamead and Compton. But the garrison were not moved by the spectacle; and so the march had to be made under "mercy of the enemy's cannon," which played upon the Cavaliers as they advanced. But they too were not easily to be daunted. The twenty-eight great guns were brought, and planted under shelter of a hedge within half cannon-shot of the outworks, and the battle began in earnest.*

Next day the King resorted to negociation. His head-quarters were then at Yeoman Heales, at Widey. During the time that Charles lay before Plymouth he tried every means that ingenuity could suggest to obtain possession of the town—force, persuasion, treachery, bribes, blandishments. Plymouth was proof against them all. It was well it should be. I do not think it is claiming too much for the fame of the good old town to say that if it had been less staunch and true—some may call it less perverse and stubborn—the entire complexion of the Civil War might have changed. The whole of the West and South of England would have been at the mercy of the Royalists; and if this had not caused the war to take a different turn, it would have beyond doubt greatly prolonged the struggle. But Plymouth was true; and while it remained loyal to liberty it absorbed the energies of a Royalist army.

Charles, in his summons of surrender, set forth:

"That God having given him a great victory, yet as his desire was to reduce his people by acts of grace and clemency, so he is desirous of setting

* Symonds.

a special mark of favour on his town of Plymouth, and doth therefore require them to surrender up the town, assuring them, on the word of a king, that they shall enjoy all their wonted privileges, and have no other garrisons put upon them than what they had in the most peaceful times; viz., in the fort and in the island; promising pardon to all townsmen and soldiers for what was past; entertaining such as shall be willing in his service; and requiring their speedy answer."

The answer was not very speedy; for the trumpeter did not come back until a drummer was sent after him, and then not until the next day, with a hint that if he came again he would be hung; but if not speedy, it was decided—"No."

Lord Digby made a private appeal to Lord Robartes, who was appointed governor on the 11th September, offering him preferment and honour on the King's behalf if he would betray his trust. To this the same answer was returned.

The next appeal was to arms. That same day, as Whitelock records, the Cavaliers made a desperate attack on the western line of defence by Stonehouse and Pennycomequick, but were repulsed with great loss; the sailors of the fleet then lying in Cattewater being especially notable for their gallantry.* According to Symonds, on the Saturday night "our souldjers gave the enemy strong alarmes, and cryd, 'Fall on,' 'Fall on the enemy' shott thousands of musket and many pieces of cannon as was the severall night before." But this did no good; and in the morning, between six and seven, the armies of the King and Maurice marched away. Symonds records with evident chagrin that the "rogues (*i.e.* the Roundheads) followed the reare, commanded by Lord Northampton: little or no hurt, onely the basest of language." This must have been even more aggravating than hard blows. To lose was bad enough; but to be abused and ridiculed far worse. It is said to have been the King's custom daily to demonstrate with his chief officers and guards at Mannamead. Daily was he received with a shotted salute from the guns at Maudlyn; and the townsfolk with grim humour dubbed the site of these idle vauntings—"Vapouring Hill." After the King left, forty prisoners of quality were sent from Plymouth to London.

When the close Siege was raised, a blockade was substituted, under the command of Grenville, appointed general of the King's forces

* Page 99; Whitelock puts the strength of the garrison at 4,000 foot and 800 horse.

in Devon and Cornwall, with special charge of Plymouth. According to Clarendon,* Grenville promised to take the town before Christmas; and to that end to raise and pay an army of 6,000 foot and 1,200 horse. That he might have the means to do this, there were allotted to him half the Royalist contributions of Devon, over £1,100 weekly; the whole of those of Cornwall, about £700; and arrears of near £6,000.

And here we must pause for a few words about Grenville, who of all the Royalist leaders in the West had the most to do with Plymouth. He was the brother of Sir Bevill Grenville, whom Kingsley calls the handsomest and most gallant of his generation, but a man of a very different stamp, not "kin to him in nature." He was brave, and experienced in warfare. Clarendon credits him with enforcing strict discipline in the leaguer before Plymouth, and of thus standing well with the country people, Maurice's men having been, in common parlance, a rough lot.† Beyond this, all that Clarendon has to say is in Sir Richard's disfavour. There was no good-will between them. Grenville is described as treating his wife, the widow of a brother of the Duke of Suffolk, because her fortune did not come up to his desires, in such a manner that she was compelled to leave his house, and take legal proceedings to secure what she had brought him. When he was put in command in the West, his first act was to make war upon his wife by seizing the estate back. He is charged with misapplying the moneys granted him for the maintenance of his army, and with being chiefly diligent in seizing the estates of partisans of the Parliament for his own individual benefit. "Though he suffered not his soldiers to plunder, he was in truth himself the greatest plunderer of this war."‡ And so we are told that he was cruel, even malignant, in his disposition. He brought no good character from the Irish wars; and to keep his hand in, would now and then hang a constable; while his minor acts of oppression were countless. He met four or five soldiers of Plymouth Garrison coming out of a wood with faggots, and made one hang the rest to save his own life, which, says the historian, "he was contented to do."§ He caught the unfortunate solicitor—Francis Brabant, of Breage—who had acted for his wife in his lawsuit, and hung him as a spy. Moreover, he was, almost from beginning to end, either the subject

* Vol. ii. p. 965.
† Vol. ii. p. 1002.
‡ Clarendon, vol. ii. p. 1010.
§ Ibid, p. 805.

or the cause of continual jealousies among the Royalist leaders in the West, which at length led to his being thrown into prison. That he was not, however, altogether destitute of good qualities, is shown by the fact that an earnest petition was at once presented for his release. He died in exile at Ghent.

So far Clarendon. But Grenville has a defender. His grand-nephew, George Grenville, Lord Lansdowne,* accuses Clarendon of being actuated by personal hatred. He throws all the blame of the dissensions on the other leaders; considers that in the matter of his wife, Grenville was the illused party—the said wife being "a buxom widow, rich in lands and moveables, but clogged with a lawsuit, and a rebel in her heart;" and justifies his conduct to the foraging soldiers and the lawyer. How, Lord Lansdowne asks, could rogues be better employed than in hanging each other? as to the lawyer, he was found in Grenville's quarters in disguise, and if he was not a spy it did not matter—he was only a country attorney! A lawyer more or less, was evidently not of very much consequence.

We shall have to note hereafter, more in detail, a circumstance which tended much to embitter Grenville's mode of warfare; but I will here only add further that he was most cordially hated by the Roundheads, who applied to him the most terrible word in the vocabulary of abuse—"Skellum" Grenville. I don't in the least know what skellum means, but it sounds very bad, and Grenville appears to have been correspondingly aggravated. There was good cause for this hatred, for Grenville had been guilty of cool and deliberate treachery to the Parliamentary cause. When he returned from Ireland, the King ordered his arrest at Bristol. He gave his parole, and went straight to London, as Lord Lansdowne suggests to get the arrears of his pay from the Parliament, whom he held to be responsible, as they had taken the Irish war out of the king's hands. The Parliament made him a major-general, with the right to raise troops and appoint his own officers. The first service he was sent upon was the siege of Basing House, and the first thing he did was to take all his forces over to the King at Oxford, where he was of course well received. I am glad to say that Lord Lansdowne, though he considers that his kinsman in all this was only "putting the old soldier on a pack of knaves," is not quite able to reconcile the proceeding to his own conscience.

Robartes is painted in various colours, after the sympathies of the

* Vide his collected works. 1736.

writers. According to Clarendon,* he was of "a sour and surly nature, a great opiniatre, and one who must be overcome before he would believe that he could be so"—a very desirable quality in a man who had to occupy such a post in such a time. Lord Lansdowne also calls Robartes "a man of a sour and surly nature." Grainger, in his "Biographies," says he had much learning, but was pedantic; and some virtues, but soured and debased by a morose and splenetic temper. On the other hand, Josiah Ricraft, in his "Survey of England's Champions and Truth's Faithfull Patriots," published in 1647, terms him "a most noble, religious, and pious lord, whose virtues spoke forth his praise, and whose valour renounced Plymouth and malignant Cornwall would acknowledge unto that day." Ricraft adds that Robartes did good service at Newbury, and that he beat Grenville and his Cornish choughs from place to place.

And now we come to the incident which set Grenville and Robartes in such deadly antagonism, that thereafter, while they commanded, no quarter was given. When the blockade was first left in Grenville's charge, his chief endeavour was to stop the supplies, and a great many skirmishes necessarily resulted. Lord Lansdowne states that in some such skirmish, wherein prisoners were taken on both sides, a young gentleman about sixteen, a near kinsman to Grenville, and of his own name, fell into the hands of the garrison; that Sir Richard wanted to ransom or exchange him, but that Robartes hung him at one of the town gates without other reply. Such is Lord Lansdowne's explanation of the passage in Clarendon, that a message passed between Grenville and Robartes, which kindled such furious resentment between them that all who fell into their hands afterwards on both sides were put to death by the sword or, what was worse, by the halter. And if Lansdowne's story were true, we need not wonder at what followed; the act would have been base and cruel, worthy of Grenville himself.

But there is a very different version of the affair. Whitelock's account† is that young Grenville was a cousin of Sir Richard's, and was persuaded into a plot to betray Plymouth to him, but discovered and executed. Rushworth adds‡ that this Grenville offered Col. Serle, then second in command, £3,000 to betray his trust, and was executed on the 24th September accordingly. And however we may lament the fate of this unfortunate young man, if

* Vol. ii. 799. † Page 101. ‡ Page 713.

he obtained entrance into Plymouth to effect such an object, by all the rules of war his life was forfeit. To me the balance of evidence seems to incline strongly in this direction.

There were not many incidents of importance during the remainder of 1644. Grenville took up his head-quarters at Buckland Monachorum, and, according to Clarendon, busied himself chiefly in looking after his own interests, receiving the money allowed, but not raising anything like the force agreed. On the 4th October a party from Plymouth took Saltash, after a short encounter; and on the 5th a boat party captured Millbrook and the fort at Insworth. This roused Grenville. He drove the Roundheads out of Millbrook, killing 40, and taking 33 prisoners.* Saltash cost more time and life. It had a garrison of 500. Of these, 200 were killed in the assault; the other 300 refused quarter, were taken prisoners, and Grenville wrote to the king that he intended to hang them.† Possibly he did; but there is no further record of their fate. This was on the 11th October.

We now come to the year 1645. I have by good fortune found among the archives of our Corporation a valuable document, which relates to the proceedings of the defenders of Plymouth during this year, and contains a store of detailed information never heretofore made public. This document is neither more nor less than the accounts of the expenditure of the Committee of Defence, and as it is peculiarly interesting and singularly minute, I propose, before proceeding with the historical narrative, to throw its light upon the general condition of Plymouth, and of the arrangements for its defence during the year. The members of the committee included Col. Christopher Savery, Francis Godolphin,‡ Justinian Peard (the Mayor), Thomas Ceely (Mayor in 1641–2), John Cawse (Mayor in 1636–37 and 1643–44), and on the death of the latter, Robert Gubbes (Mayor in 1650–51). Sir John Bampfylde, Col. Kerr, Col. Crocker, and John Beare, acted also, and the treasurer was Timothy Alsop, Mayor in 1648–49, and twice elected representative of the town under the Commonwealth. The Mayor was the chief of the

* Rushworth, pt. iii. vol. ii. p. 717. † Symonds's "Diary."

‡ This was Francis Godolphin, of Treveneage, Cornwall, the father-in-law of John St. Aubyn, ancestor of Sir John St. Aubyn, M.P., himself a colonel of horse in the garrison, while his brother Thomas was colonel on the other side. Sir Francis Godolphin, the head of the Godolphin family, and all his sons, were staunch Royalists.

Committee, which acted at first under the authority of Lord Robartes, who continued governor until May, when he was removed, in spite of a petition for his retention, by virtue of the Self-Denying Ordinance, and the government vested in the Committee of five, Col. Kerr having the military command. The Committee had powers to execute martial law. Sir John Bampfylde was governor for some little while.*

Here are the records of the appointment of the Committee, copied into the book of accounts by Henry Rexford, clerk :

Whereas Sr John Bampfeilde, appointed by ye Committee of the West to be one of those whoe should distribute the last 2,000 sent for the use of this garrison and other purssons (?) expressed by their last Lres, refuseth to attend the saide service; and whereas Collonell Kerre, one other named by ye said committee to attend the service, excuseth himselfe in respect of other imploymt.; and whereas the necessities of this garrison requireth ye speedie performance of this service; I doe therefore appointe Collonell Christopher Savery, Harcourt Layton, one of ye Comrs. of Parliament, Mr. John Cawse, and Mr. Thomas Ceely to sett with, joyne, and to be assistant vnto Justinian Peard, now maior of Plymouth, and Francis Goodolphin, esqr., two of ye psons named for ye said service; and for their soe doeinge this shalbee their warnt.

Dated ye 19th day of Febr., 1644. J. Roberts.

Whereas Mr. Cawse is deceased, and there is required for the despatch of this garrison one other to supply his place, I have appointed Mr. Robert Gubbes of this towne to attend ye Maior, and joine with and assiste for the pnte service.

Dated ye 25th of March, 1645. J. Roberts.

I take it that in these appointments Robartes acted on behalf of the Committee of the West, of which he was a leading member, as well as in the capacity of governor of the town. February, 1644, of course means 1645.

The first entries in the accounts refer to the payment of £1,805 16s. for the Kentish regiment of Col. John Birch from October 29th, which the Committee of Kent had to repay;† but the regular account does not commence until February, 1645 [1644 old style]. From the 15th February to the 3rd March the sum total sent up was £2,135 4s. 2d. The chief item of expenditure was for the weekly pay of the officers and soldiers of the garrison. This passed chiefly through the hands of Commissary Slade; and there

* He was an ancestor of the present Lord Poltimore.

† About the middle of the year this Kentish regiment was sent to Lyme.

was another commissary, named Clapp. The first entry under this head, on the 17th February, is for £459 18s.; but the amount gradually and largely increased, apparently indicating that as the year went on the garrison was considerably strengthened. In the last week of December the amount thus paid was £723 3s. 2d.; and in January, 1646, it reached its highest mark, £734 19s. 8d. These payments did not include the cost of maintaining the guards at the town walls and the outworks. Their pay was handed over fortnightly—sometimes, when money ran short, once in three weeks—to the officers in command. The first entry under this head, also in February, amounts to £134 18s. 6d., which includes the cost of coals and candle-light. The outworks were dismal places, I fancy, in the winter nights; and the soldiers would have fared badly without fires. Candle-light was an absolute necessity. It was not all paid for in the lump; for I find an entry, March 4th: "George Batten for candle-light for Frankfort, ye 2 halfe moones, and ye drawbridge at Gascoine gate, 17s. 8d.;" and there are others of the same character. Candles, it may be of interest to know, cost 5½d. per lb., 6 doz. for Stonehouse Guard being charged in November £1 13s. The fact that the pay for "ye commanders and gunners of ye outworkes and wall" was handed over to the officer in command, has preserved the names of those who at different times occupied that honourable post. The amount paid per week ranged from about £70—£69 6s. 6d. is given in one week in March, and £72 18s. 11d. in another—down to a little over £50. There is an entry in December that Capt. Walters had £113 11s. for two weeks' payment of the commanders, gunners, and seamen of the outworks, "shippes in Lary," and redoubts on the town wall. The variation in amount is easily accounted for, since the number of men on guard would depend mainly on the activity or inactivity of the enemy. What the ships in Laira were there is no record; but there are entries of payments made to the masters of vessels named the *Welfare*, *Diana Hopewell*, *Elizabeth and Susan*, *Hampton*, *Hopewell of Plymouth*, *Dymond*, *Endeavour*, and *Amity of Plymouth*, employed in the public service in various ways, the latter in May at Laira Point. Governor Kerr received £8 a week towards his housekeeping—something akin, I presume, to the modern table allowance.

I had hoped that the accounts would furnish some exact details

as to the rates of pay, but herein I was disappointed, the individual entries being too few, and moreover varying too much, to make it safe to draw any very definite conclusions. Richard Phillips is paid £1 8s., a week's pay as lieutenant. Then we have under date July 10th, "Pd Margery Yeolande for 3 weekes paye due unto Walter Yeolande deceased lately taken by the enemy at Plymstoke 14s." Capt. Shilston Calmady had £5 5s. for one week's pay; Capt. Burgess only £1 1s. Lieut.-Col. Elias Crymes £2 16s. for three weeks' arrears of billet money; but a lieutenant only £1 8s. Lieut.-Col. Moore is credited £10 10s. for one week's pay. George Hall, drum-major of the town regiment, with the rest of the drummers, £4—for what length of service is not stated. Gunners in the outworks were paid at the rate of 7s. a week. The chaplains of the garrison were not neglected. April 9th, "Paid Mr. Stephen Midhope minister for his labour in ye ministery wh in this garrison the summ of £5." Mr. Francis Porter, afterwards the first minister of Charles Church, had for his ministry a like sum; Mr. J. Wills also £5, and Mr. George Shugge £10. What time these payments covered is not stated. Abraham Cheere, the first recorded pastor of the Baptist Church of Plymouth, who served in the train-bands as a full private, was "for some few weeks, unknown to him and against his will, mustered a chaplain to the fort, but quickly got himself discharged of that again."* His name does not appear in the accounts.

The Committee had in charge the whole question of supply. There are records of payment for boots, biscuit, beer, forage, and various articles of clothing. At times funds ran short, and then they borrowed from all who were willing to lend until fresh supplies arrived. And they were practically grateful for the relief of their necessities. On the 20th of December, Capt. Somester had £5 "for his paines in bringing down money for the supply of the garrison." It must have been a great slice of luck when, on 20th November, 1645, the Earl of Warwick brought in a barque laden with kerseys for clothing the King's soldiers, which he had taken.

What strikes me as very quaint is the methodical way in which the Plymothians managed the defence. The accounts abound with entries of payments for masons' and carpenters' work on the wall and at the outworks, which seems to have been treated quite as a

* "Words in Season," by A. Cheare.

matter of ordinary business. Parts of the wall were battered down, or a weak point in the outer line of defence would need palisading. The Committee sent their orders to their tradesmen, and these went and did the work—to all appearance, much in the same way as they would have followed out the ordinary details of their occupation—and came up for their pay with exemplary regularity. These old Puritan folk took a lesson from the builders of the wall of Jerusalem under Nehemiah. "They which builded on the wall, and they that bare burdens, with those that laded, every one with one of his hands wrought in the work, and with the other hand held a weapon. For the builders, every one had his sword girded by his side, and so builded." All this illustrates with singular force the matter-of-fact earnestness and straightforward simplicity of character which characterised these rugged Roundheads, and in the end won them a victory at first very doubtful.

There was a very profitable business carried on in horse stealing. So far as I can make out, the chief supplies of horses for the garrison were obtained by levying requisitions on the besiegers. This was profitable, because the Committee regularly paid for all such captures. In April we find, "Item: P^{d} Cornett Rolles for ye horses taken by him from ye enemye yesterday, four of which were lifted in Collo Sentaubyn's troope for ye service, and ye other imployed for ye publique service in ye garrison, £4 10s." Horse lifting flourished with the greatest vigour towards the end of the year, and the reward dropped from £1 to 10s. Land was rented of Ambrose Diggens at Cattedowne for keeping the troop horses by night.*

To return to our narrative. When 1644 closed the besieged were in a much better position than when Charles made his unsuccessful assault. The interim had been well spent in strengthening the defences, which Grenville, although he scoured the country and kept up an aggravating blockade, did little to prevent. It is evident, from the entries in the account-book, that the line of defence was considerably more extended than it had been twelve months before, though its general features remained the same. Half-moons had been added to the defences, at least of Gasking and of East Gates; the chain of earthworks and their communications strengthened, and the former palisaded; and the detached redoubts

* Vide Appendix for miscellaneous entries from the Siege Accounts, and lists of officers and traders.

made more formidable, whilst others were added. The ground held now extended from Mount Batten on one side to Mount Wise on the other. There is no evidence that at Mount Wise there was more than a guard; but at Mount Batten a fort of formidable character was reared. Mount Stamford remained as left when slighted by the garrison after the advance of Essex.

Grenville at length resolved to do something to justify his proud title of King's General in the West. In January he collected a force of 6,000, and made a desperate assault upon the outworks. He attacked them at four different points; that is, I take it, Lipson, Holiwell, Maudlyn, and Pennycomequick Works. For a time the fate of the town appeared to tremble in the balance. He is said to have taken three of the outworks, and to have turned their guns against the town.* Robartes, however, credits him with only capturing one;† and probably the solution of the contradiction is that he gained at first a footing all along the line, but was able to make it good at one point only. This would be either Pennycomequick or Maudlyn. But even that modicum of success was evanescent.

With the loss of 300 men slain, 75 of whom were left dead around the batteries, and many hundreds wounded, Grenville was beaten off at every point save one. The captured work was then stormed on all sides by the Plymouth men, who behaved with extraordinary gallantry, and speedily carried, all who were within being either killed or taken prisoners; those who did not fall eventually surrendering upon quarter. The intelligence of this success was very welcome to the House of Commons, and care was at once taken for the supply of the garrison. The city of London petitioned that due regard should be had to the necessities of the town. Moreover, news came that Grenville, under discontent, had pistolled Col. Champernowne and his brother.‡

After this bout the town wall and outworks stood greatly in need of repairs, which were at once executed. Grenville's next movement was upon the other side of Cattewater. In the night of the 17th February his troops cleverly effected a lodgment among the ruins of Mount Stamford, and raised a breastwork of faggots twelve feet thick, which they intended to complete on the following night. The garrison had not expected this. But their measures were soon matured. The little force at Mount Batten was strengthened

* Whitelock, p. 119. † Ibid. ‡ Ibid, p. 121.

at noon by a party of horse and foot; the latter partly seamen, under the command of Capt. Swamley, who had just relieved Plymouth, and landed a body of soldiers.* A feint sally was made from Pennycomequick, which kept the main body of the besiegers engaged. And then, under cover of the fire of sixty guns from the ships and forts, which "beat up the dust about the Cavies ears," the new Fort Stamford was attacked and carried. The Cavaliers were driven from the field and pursued two miles. Twelve officers, including a lieutenant-colonel, a major, and four captains, and ninety-two soldiers, were captured; and in the new work were found 300 arms, and good store of mattocks, shovels, and faggots. Only one of the attacking party was slain, and that by accident. There is an entry that £6 worth of biscuit was supplied by Thomas Bowden, on the 18th February, for the soldiers in fight with the enemy at Mount Batten.

We know very little about the conduct of the Siege for the next few months. No general attack appears to have been made; but the garrison did not relax their efforts to improve the defences. Little Maudlyn and Little Pennycomequick Works were erected, additional fortifications raised at Lower Lipson, and a new redoubt thrown up at Mount Gould, which took its name doubtless from the dead colonel. Considerable sums were likewise spent in palisading the whole line of ditch and rampart.

Grenville was meantime engaged at the siege of Taunton, where he was dangerously wounded in the thigh. He left scarce 2,000 foot and 400 horse before Plymouth.† Indeed it does not seem that from the date of the fight at Mount Stamford the town was in any serious danger, although it was continually harassed. The sending away of the Kentish regiment proves this. In June, Sir John Berkeley was placed in command of the Siege, but he failed to do more than his predecessor, and never attempted to go beyond a blockade. It is questionable whether at this time the garrison were not the stronger party of the two. There had been a continual drain on the resources of the Royalists, promoted by the action of Grenville, and many of the King's soldiers had deserted to the Parliament,‡ who were taking abundant care for the needs of the besieged. An ordinance passed in March to raise one per cent. for the supply of the town and the recruiting of the Kentish

* Whitelock, p. 129. † Clarendon, vol. ii. p. 966.
‡ Whitelock, p. 147.

regiment. There was another order for money in May; and in October it was reported that Plymouth, though beleaguered, was in no want. Yet the straits of the Committee had been so severe, that in the early part of the year they had had to borrow three several times from their friends,* and even then were only able to pay some of their debts in coals at the rate of £1 a quarter. Autumn, however, found the townsfolk not only in good circumstances, but in good spirits. They felt secure themselves, and were cheered by the tidings of success elsewhere. To the bearer of the tidings of the great victory at Naseby they gave a silver tankard, thus recorded: "Paid Johane Chandler widdow for a silver tankard weighing 12 ounces given a gentleman y^{t} brought the intelligence of y^{e} defeateinge y^{e} King's army by Sir Thomas Fairefaxe £3 9."

In September Sir John Berkeley was succeeded by General Digby; and in the following month Col. Welden, who had been engaged with Fairfax at the siege of Bristol, and had at one time conducted the defence of Taunton, was appointed governor of Plymouth. It does not appear as if the appointment took immediate effect; for Kerr continued in command until the following January. Digby was not more active than his predecessors, and confined himself to the blockade until December. He then did make an effort to take the town. But it was by treachery. Whitelock states † that the agent was hanged by martial law. This can hardly have been the case, unless Digby tried twice. The only attempt of which we have any information is that recounted in the following correspondence between Digby and Kerr:‡

Sir,—I am troubled to understand, that through the ingratitude of those you serve you are likely to be rewarded with the dishonour of having a person of much inferior merit put over your head, an injury insupportable to any man of spirit, and which may offer you a justifiable occasion of doing a very eminent service to your Native King and Country; and which if you will embrace to deliver up the Town with the works of Plimouth, I shall engage myself on my honour and the faith of a gentleman, you shall be rewarded with ten thousand pounds, and have the command if you please of a Regiment of 500 Horse, with what honour yourself can desire. Sir, be not scrupulous in taking the advice of an enemy that desires heartily on these terms to become your true friend and faithful servant,

For Col. Ker, Governor of Plimouth. Jo. Digby.

30 Decem.

* Vide Appendix. † Page 191.

‡ Sanderson's "History of the Life of King Charles," pp. 839 40.

Sir,—Your motion to Treason I have seen, and detest it; it is below my spirit for personal injury (supposed only by an enemy) to take national revenge, and for a Punctillio of honour to take advice from Hell, and betray my trust. I am sorry that one so ingenious as your selfe should abuse your natural parts only to do mischief. Yet I have no reason to wonder much at your persuasion to treacherie, because I have had the experience of the indeavours of your Family to corrupt others also. I remember the Gunpowder Plot,* the letter which your brother writ to the Lord Roberts in this place for the same purpose; and his Negotiation with General Brown at Abington. Surely these Principles came from Spain; but you should have told me also that Spanish proverb, To love the Treason, and hate the Traytor, &c. Your assured servant,

20 Dec. James Ker.

The work of strengthening the defences still continued. So late as December we find the platforms on the earthworks kept efficient; and even in the following month there was a payment of £42 19s. 2d. for building a new guard-house and repairing the town wall at Frankfort.

After this period of quiescence the first move was made by the garrison resuming the offensive. The besiegers had a small redoubt at Kinterbury. This was assailed—I suspect by water as well as by land; for there was nothing to prevent boats being sent up Hamoaze—and easily taken, with 17 prisoners and store of arms and ammunition. From Kinterbury the Roundheads marched to St. Budeaux, where the church and tower had again been turned into a garrison. After an hour and a half's hard fighting, the church was captured, and in it Major Stucley, 20 other officers, and 100 soldiers.† Another account puts the number of prisoners at 92, and adds that 55 horses with arms and ammunition likewise fell into the hands of the victors.‡ Ten of the defenders were killed, and nine of the Roundheads, including Major Haynes, the officer of highest rank slain, so far as we know, on the side of the besieged during the whole of the operations.

And here arises a curious point. All the printed authorities agree that the captures of Kinterbury and St. Budeaux took place in January. On the faith of the records of the Committee it was clearly in December; and I can only account for the discrepancy by the assumption that the news reached London in the following month, and was by accident attributed to the latter date. There is

* Sir Everard Digby was one of the conspirators.

† Vicars's "Parliamentary Chronicle," vol. iv. pp. 340-1.

‡ Whitelock, p. 193.

an entry which places the fact beyond a doubt, under date Dec. 29th: "Item: Pd Comry Sam. Slade ye summe of 10*l.*, & is for paymt of the like summe vnto Captain James Peares, for ye buyeinge of necessaryes for Maior Haines his funerall, who was lately slaine in assaultinge St. Buddox Church." The funeral, by the way, cost a good deal more than this; for there are several subsequent payments on this behalf, some out of deceased's arrears. And there is another December entry that is equally clear—one of £2 15s. paid to certain boatmen for pains and boat-hire in bringing in timber from Kinterbury work, and for five muskets and one carabyne, the 15s. being for the latter.

Ricraft, already quoted, states that Kinterbury Fort was taken by sudden storm, which I interpret to mean by surprise. After Kinterbury and St. Budeaux were captured, Buckland Abbey was also taken by storm, and in it 100 prisoners. Saltash when captured had in it five pieces of ordnance. Ricraft speaks of Haynes as a gentleman of "worth and quality."

We find in the accounts under date January 5th: "Item: Pd Comry Sam. Slade 20s., and is for payment of ye like summe vnto Leiuet Kekewich for his psnte supply, haveinge beene lately wounded by the enemy at St. Budeax Church."

The last entry in the Siege Accounts of actual operations refers to Fort Arundel, a work of the enemy, apparently somewhere on the south of Cattewater, probably near Hooe, since we find it mentioned in association with a work at Plymstock. January 5th: "Item: Pd Maior Barnes 16s. 8d., and is for paymt of ye like summe unto 25 souldiers ymployed in ye raissinge of fortificacions against Forte Arundell on ysueinge forth of ye fources of ye garrison on Saturday last."

The advance of Fairfax from Exeter to Totnes put an end to the Siege, which indeed had now become a mere name, and on the 18th of January it was finally raised. The Royalists decamped in such a hurry that they left guns, arms, and ammunition behind—seven of the former at Plympton. We need not follow up the narrative of Fairfax's victorious march into Cornwall, where he caused Hopton's forces to surrender, thus, as some of the old soldiers rejoiced, making them even for the Essex business. Fairfax had already retaken Essex's guns at Bristol and Bridgwater. The garrison of Plymouth at this time is said to have numbered 2,500, besides the train-bands.

There were still two Royalist garrisons in the neighbourhood—Mount Edgcumbe and Ince House. For the surrender of the former, Fairfax offered good terms. If Col. Edgcumbe would

"disgarrison his house, lay down arms, and perswade those of the Cornish in whome hee hath good interest to sitt down and submitt to all orders and ordinances of Parlamnt, in that case I doe undertake that his house shall not be made a garrison, but that hee shall have the free liberty of it, security of his person and goods as to my army, and further, that hee shall have from mee a lre. of recomendacion to the Parliament or committee for ye army, that hee may by them be dealt withal as one that deserves their favour for his liberal and seasonable coming in."

Mount Edgcumbe was eventually surrendered to Col. Hammond, Governor of Exeter, who found in it thirty pieces of ordnance and store of arms and ammunition.*

Ince House held out until the end of March. On the 29th of that month a party from Plymouth summoned it to surrender. The garrison returned a scornful answer. Thereupon the Plymouth men sent for their cannon, wherewith to battle. The sight of the great guns took the scorn out of the Cavaliers; they begged quarter, and had it. The House was armed with four guns, and these, with ninety muskets, were taken.

This was the last act of the Siege tragedy, which now with intervals had continued for over three years, and the inhabitants could reckon the price of their gallantry. The success was glorious, but it was bought at a terrible cost. The registers of St. Andrew show that during the Siege there were upwards of 3,000 interments, whereas under ordinary circumstances these should not have much exceeded 600. From the data at hand I estimate that of the extra 3,000, 1,000 were soldiers† and 2,000 townsfolk. Nor does this exhaust the fatality. It neither includes the losses on the side of the besiegers, whether in the field or from the fatal "camp disease," nor the deaths of those of the garrison whose bodies were buried where they fell. What the total loss of life was we can only estimate; but taking the length of time over which the operations extended, noting that there were several occasions when over 100

* Whitelock, p. 207.

† The churchwardens' books of St. Andrew parish for the Siege years contain entries of nearly 500 graves for soldiers, poor folks, and Cavaliers, 284 being for the year ending Easter, 1645. Mr. J. Brooking Rowe, to whom I am indebted for the information, states that these entries refer only to coffined interments, which were the exception.

were killed—one at least, when more than 300 fell—I do not believe we shall exaggerate if we assume that the deaths due to the Siege reached nearly 8,000; in other words, that in three years or so a number greater than that of the entire population of the town was swept away. The whole history of the civil war fails to supply a parallel to this.

Nor did the evil effects of the Siege end here. I pass over the patent fact that the trade of the town was, for the time at least, ruined, a point made certain by the act of the Corporation of London, who, in May 1646, petitioned the House of Commons that the Plymouth duties might be taken off.* Scores of families, by the deaths in the field of husbands and fathers, were deprived of their means of support and reduced to the greatest misery. After a while provision was made for their needs.

The Siege was thus a very real thing to the townsfolk for many a year after the last sally had been made and the last shot fired. But little by little its memory failed: as the old earthworks which had been attacked and defended so bravely crumbled into decay; as, creeping slowly onward, the growing town burst the cincture of the once well-guarded wall; as one by one the ancient gates passed away. A hundred years ago there were still living men whose fathers had taken part in the great struggle. Fifty years since tradition was almost dead; but there yet remained many relics of the old defences. Coxside Gate, Friary Gate, Gasking Gate, Old Town Gate, Frankfort Gate and Martyn's Gate had disappeared; but Barbican Gate and Hoe Gate were left, with several portions of the wall and of the great outworks. Now we can trace few vestiges of either. The last of the gates has gone. The only fragments of the wall are by Tothill Lane, at the head of Gasking Street and behind Ham Street. And so with the outworks. There is just discernible the forward angle of the redoubt at Lipson to the east of Freedom Fields, and thence stretching away to the mounds in front of Longfield Terrace, all that is left of the work at Holiwell, the line taken by the connecting ditch and rampart. The bank which yet obscurely marks the site of Maudlyn is† disappearing to give place to the Blind Institution. Fort Stamford occupies the side of Mount Stamford. The hill above Laira Bridge, whereon the work at Prince Rock stood, seems to retain traces of artificial scarping. On the sites of the other defences we have little but a

* Whitelock, p. 212. † April, 1875.

few indistinct surface irregularities, though excavation in such localities has rarely failed to bring to light some eloquent witness of the Siege—burial pits, cannon balls and bullets, or the remains of arms. At some points there have been extensive finds of tobacco-pipes, showing that the sturdy soldiery were not deprived of all creature comforts during their weary watches.*

Another five-and-twenty years, and, at the rate at which Plymouth is growing, scarcely an exterior vestige of the Siege will remain. The whole of the ancient battle-fields will be covered with houses, and we shall be able to apply in its entirety, as we now can in part, the words of Dickens, in the "Battle of Life"—

> If the host slain in the field could have been for a moment reanimated in the forms in which they fell, each upon the spot that was the bed of his untimely death, gashed and ghastly soldiers would have stared in hundreds deep, at household door and window; and would have risen on the hearths of quiet homes; and would have been the garnered store of barns and granaries; and would have started up between the cradled infant and its nurse; and would have floated with the stream, and whirled round on the mill, and crowded the orchard, and burdened the meadow, and piled the rickyard high with dying men. So altered was the battle-ground where thousands and thousands had been killed in the great fight.

It will not, I hope, be deemed by the members of this Society a waste of time that I have asked their attention to the narrative of one of the most important epochs in the history of our town, drawn from the most varied sources at my disposal, and recounted with such skill as I possess. To me, I confess, the task has been one of the pleasantest, though not the lightest, I have undertaken. Tracing the progress of events, and marking alike the trials and the braveries of the Siege period, sympathies have been aroused, and feelings strengthened, and I have waxed prouder and prouder of the old town, which in times of such terrible purpose, times of such vital consequence to the future of England, remained true—though, for the most part, these were very evil and shifting days indeed—to the cause which it at first deliberately espoused, and became thus the key-stone of freedom in this West of England.

* There is an amusing appeal to the Parliament, of this date, from the poor tobacco-pipe makers of London and Westminster against a pipe duty, on the ground that it would interfere with the trade by leading to the burning of foul pipes!

APPENDIX.

THE interesting character of many of the particulars contained in the Siege Accounts, has induced me to make a series of illustrative extracts, which I have arranged under different heads.

OFFICERS OF THE GARRISON.

The officers of the Garrison in 1645–6 included the following:

Governor.—Col. Kerr.

Governor of the Fort and Island.—Arthur Upton, Esq.

Master Gunner.—Thomas Bolitho.

Colonels.—John Saint Aubyn, Crocker, Anthony Rows, Fowell, Leyton, Christopher Savery, John Birch, Brooking, T. Trendall.

Lieut.-Colonels.—Kekewich, T. Fitch, Robert Moore, Elias Crymes.

Majors.—Symonds, Foxworthy, Haulsey, Worthevale, Barrett, Haines, Martyn, Gabriel Barnes.

Captains.—Shilston Calmady, Voyzey, Hawken, Courtney, Roope, Hall, Penrose, Lyall, Burgess, Baghett, Dutton, Catterell, Cozens, Sampson Crabb, Bawden, Owen, Louis Perry, Wools, Diment, James Pears, Henderson, Holt, Pope, Richards, Fountayne, Barnes, Rowe, Robert Savery, E. Blagge,* Whittie, Trayes, Richard Langherne, J. Rows, E. Weston, W. Wotton, John Richards, John Bawden, Wm. Gregory, Hoop,* Adrian Anthony,* R. Clarke,* Jn. King,* James Randle,* George Fownes,* Nath. Walters,* Hy. Hatsell. Those to whose names an asterisk is attached are mentioned as at different times commanding the outworks. Weston for some time was master of the hospital, and was apparently succeeded by John Hall, physician.

Captain-Lieutenants.—Roe, Vaughan.

Lieutenants.—Ellis Greenwood, G. Wyatt, Nicholas Bowy, Thos. Emerson, J. Tapson, Richard Phillips, Walter Clifford.

Ensigns.—Plumley, Gwilliam, J. Crocker (reformado), N. Birkehell, Ed. Webb, Digory Hony, Arthur Carter (reformado), Anthony Gefferys, R. Gest.

Cornets.—Edward Beare, Clarke, George Charleton, Memory, Rolles.

Commissaries.—Samuel Slade, Richard Clapp.

Chaplains.—Alexander Grosse, Stephen Midhope, Shugge, J. Wills, Francis Porter.

Physicians.—Charles Goldsmith, John Hall.

Surgeons.—Samuel Lumley, John Parker.

Quartermaster.—Edwards.

Masters of Marshalsea.—Robert Chislett, James Deeble.

Master of Magazine.—John Allin. He had coadjutors.

PLYMOUTH MERCHANTS AND TRADESMEN IN 1645-6.

The Account also contains the names of a large number of persons with whom the Committee did business in various matters of supply of goods and work. Thus we have:

Apothecary.—Christopher Eaton.

Blacksmiths.—William Maynard (made ironwork for "sweyne's feathers"), Thos. Bootie, Jn. Letheren, J. Anderton (made crooks and heads for palisades), Ts. Parker, Jn. Bennett, Philip Eliott, Arthur Yeole.

Carpenters, Masons, &c. (chiefly employed in repairing and improving the outworks and town wall).—Oliver Werry, Jn. Kingston, James Deeble, Ralph Weston (or Wescott), Robert Andrews, John Briant, Thomas Dunstan (mason), Jn. Foster, Wm. Medland, Kettleby Woodhouse, Ludowick Stitson (carpenter), Robert Arundell, Wm. Moore, William Murch, William Gaye, Matthew Stanley, Yeoland, Ts. Boyes. Andrews was extensively employed, as were Woodhouse and Moore.

Chandlers.—Amy Gladman (widow), Henry Batten, George Batten.

Cutler.—Francis Fownes.

Cordwainers.—Wm. Dunridge, Richard Dunrith, Ed. Keagle, Jn. Lane, Richard Morgan, Jn. Kempe, Thomas Arrowsmith, Jn. Lapthorne, Wm. Webb, Richard Webb, Barnard Burd, Richard Chase, Roger Wannell.

Cobblers.—Jn. Kendall, Mark Batt.

Farriers.—Andrew Joye, Thos. Penny, Philip Hatch, Wm. Fuge, Wm. May, Ambrose Gubby, J. Hoop, Ts. Parkins.

Gunsmiths and Armourers.—Richard Manning, John Anderson, Ts. Bickford, William Stenhouse, Peter Scott, Judith Turtly

(widow), Ralph Briant, Jn. Galpin, G. Hall, Wm. Hammett, Richard Veale, James Batten, Jn. Williams, Francis Roe, Anthony Richards, Thomas Quicke, Wm. Pownell, Jn. Gaye, Richard Teate, Wm. Fursley.

Mercers and Tailors.—Christopher Ceely (sold 2,346 yards of dowlas), Thomas Yabsley (cloth), Caleb Brookinge (cloth), Humphry Thomas (kerseys), J. Harris (kerseys), Thos. Durant (kerseys), Edward Pattison (cloth), Thomas Dalkeinge.

Saddlers.—Richard Cory, Thomas Kingston.

Shipwright.—Robert Hingston.

Then lead was bought of Peter Kekewich; cheese of Henry Goyne; beer of John Paige; materials for fireworks of John Whiddon; coals of John Searle. Benjamin Butt had 7s. for a coffin. Timber was bought of Hugh Cornish, Simon Jackson, Crispin Painter, John Allen; biscuit of Thomas Bowden.

AMMUNITION SUPPLIES IN 1644–5.

Ammunition received from London and delivded ye mrs. of ye magazine in the Castle from 29 Sept., 1644, to April 15, 1645:

8ber 4.—Inpr. recd. by Mr. Holmes out of ye *Endeavour* of Plymouth 100 barrels of powder	100
Five hundred and sixtie musketts	560
One hundred firelocke peeces	100
Sixe hundred paire of bandaleroes	600
Five hundred seuventie nine beltes	579
Ninetie fower boxes of cartridges for carrabines	094
Seuventie and five bundles of match	075
Fortie barrells of muskett and carrabine shott	040
1644.	
October 7.—Receaued out of the *Exchange* of London, William Hooper master, fortie eight barrells of powder, fower	048
hundred musketts	400
7th.—Receaued more out of the *Elizabeth* of London, Mr. Coppinge the master, fiftie barrells of powder	050
Three hundred snaphance peeces	300
One maunde of boxes of cartridges for carrabines conteininge 300	300
Fower dry Fatts of match	004
7.—Receaved more out of the *Experaince* of Plymouth, Mr. Clarke mr., one hundred new saddles	100

One hundred old saddles 100
Fower chirurgeon's chestes 004
1644.—27 pigges of lead.
Dec. 21.—Recd. by ye Lo[d] Roberts' warrt. into ye magazeine from London musketts 500
Five hundred paire of bandaleeres 500
1644.
Jan. 3.—Recd. out of the *Emreald* of Plymouth, from London, Francis Washington, mtr., 100 barrells of powder, whereof was 12 barrells welt spoiled 100
Five hundred swords 500
Five hundred beltes 500
1800 iron shott 1800
Feb. 11.—Recd. from Capt. Stunsby, out of the *Herta*, by warrt. from ye Lo[d] Roberts, 7 barrells of powder 007
18 skeanes of match 018
50 sacer shott 050
Recd. same tyme by ye same warrt. from Capt. Pilgrime out of the *Hinde* Friggett 100 sacer shott 100
20 skeanes of match 020
Recd. out of the *Francis* of London, Mr. John Hogge, 100 barrells of powder 100
Musketts 500
Five hundred paire of bandaleeres 500
28 paire of pistols and holsters 028
40 barrels of muskett shott 040
Eight dry fatts of match, alsoe one bunddle and 1 fardle of match 8
30 drum heads 30
20 drum covres 20
Ten paire of guards 10

MONEYS BORROWED AND REPAID.

At the end of March, 1645, the following sums were repaid by the Committee; Brian Rogers, £80; Justinian Peard, £50; Sir John Bampfylde, £50; John Cawse, £50; Robert Gubbes, £50; John Paige, £50; Stephen Trevaill, £50; Thomas Crampporne, £25; Nicholas Opye, £50; Bartholomew Nicholls, £30; Christopher Bowden, £50; Christopher Ceeley, £30; John Carter, £30; Lady Alice Buller, £149 5s.; Thomas Crampporne, £15; Nath.

Searle, £28; Edward Caunter, £10; Robert Westaway, £10; Robert Glowne, £5; John Harris, £10; William Birch, £10; Lawrence Beele, £15; Joseph Tylge, £10; Johane Bitterlye, £6; Philip Clarke, £20; Jno. Nicholson, £5; John Humphry, £10; John Hoop, £15; Frances Roe, £15; John Laurey, £20; James Parddis, £10; Henry Peterson, £5; Philip Francis, £12; Richard Fryer, £10; Arthur Rows, £10; Robert Brendon, £10; Abraham Jennens, £25; John Paige, £10; Agnes Edgecumbe, £15; Elizabeth Rowe, £10; Abraham Rowe, £40; Geo. Rawlinge, £10; Johane Baker, £10; Thomas Short, £30; Alice Miller, £25; Nicholas Bennett, £30; Thomas Durant, £10; Hugh Cornish, £20; Henry Webb, £18; Henry Peterson, £5; John Masters, £5; Capt. Richard Roope and Mr. Humphry Gayer, £35.

Repaid June 9th: Justinian Peard, £150; John Maddocke, £11; Hugh Cornish, £25; John Paige, jun., £20; Christopher Bearden, £30; Wm. Birth, £10; John Paige, sen., £40; Nathaniel Searle, £10; Humphry Gayer and Capt. Nicholas Roope, £34; Thomasine Simons, £30; Samuel Northcott, £100; Abraham Jennens, £30; Joseph Wily, £10; Laurence Beele, £15; William Geffery, £15; Richard Spurwell, £10; Philip Clarke, £10; Thomas Ceeley, £10; Thomas Crampporne, £10; John Nicholson, £5; Margaret Martyn, 20; Humphry Thomas, £13; Elizabeth Rowe, £5; Johane Bitterly, £6; Francis Pode, £10; Edward Caunter, £13; Jno. Masters, £5; James Edgcumbe, £15; Nicholas Opie, £30; Nicholas Bennett, £40; Mary Polstagge, £5; John Gubbes, £5; Stephen Treville, £10; John Hele, £50; Brian Rogers, £30; Judith Symons, £10; Caleb Brookeing, £14; John Humphry, £10; Robert Brendon, £10; Robert Glowne, £5; Samuel March, £5; Elinor Lepper, £5; John Pears, £10; Hendrich Peterson, £10; Joesh Searle, £10; William Warren, £20; Elizabeth Pike, £10; Johane Baker, £5; Bartholomew Nicholls, £10; John Lawry, £10; Robert Creese, £3; Thomas Caunter, £10; Thomas Short, £10; Alice Miller, £20; Richard Clapp, £5.

Monies repaid July 5th:—John French, £10; Richard Spurwell, £5; Christopher Ceely, £20; Jno. Maddock, £5; Phillip Clarke, £10; Laurence Beele, £5; John Allin, £5; William Gefferye, £5; Bartho. Nicholls, £22; Jno. Paige, £20; Thomas Crampporne, £20; Robert Gubbe, £20; Thomas Caunter, £10; Robert Glowne, £5; John Nicholson, £5; Anne Edgecombe, £15; Humphry Thomas, £10; Henry Peterson, £10; Brian Rogers,

£20; Jno. Lawry, £7; Elizabeth Pike, £15; Henry Webb, £15; Edward Caunter, £15; Johan Baker, £5; Jno. Pears, £10; N. Bennett, £20; Stephen Trevaill, £30; William Birch, £8.

These entries afford a tolerably conclusive clue to the monied men of the borough in those days.

ORDERS OF THE COMMITTEE.

There still remain in the account-book two loose pieces of paper to the following effect. The second was evidently written when the first was brought up for payment.

Plymo 8ber 30: 1645

Mr. Cornish

We do desire you to deliver vnto Walter Huxeham one halfe hundred of deales For wch you shall receive satisfaction from this committee

To Mr Hugh Cornish John Beare: Justinian Peard
Tho: Ceely

Plymo: Jan: 6: 1645

You are to paye vnto Mr. Hugh Cornish for One hundred and a halfe of deales delivered for the use of this Garrison the summe of

To Mr Tim°
Alsoppe trer

MISCELLANEOUS ENTRIES.

Annexed are notes of a few miscellaneous entries:

March 11.—An order was made for a quarter of coals for boiling beanes for the prisoners.

Apl. 11.—Paid Rd. Richards £1 5s. for a horse, to be allowed in his arrears of the pay due to him "for his journey in Cornwalle, wr^in^ he lost one horse and furniture by the enemy in carriadge of ammunicion."

Apl. 19.—Paid Capt. P. Whittie £6, for freight of £2,000 sent down.

May 22.—For a messenger for bringing letters from the committee of Lords and Commons of the county, £2.

July 17.—"Item: P^d^ Mr. George Hughes [the vicar of St. Andrew's] for one qrtres rent of 3 stables, end^eing^ ye 24 day of June last for service of the troops w^hn^ this garrison, £1."

About the end of this month Capt. James Pearse was sent to Fairfax, and came back sometime in August.

August.—John Woollaway had £5 for making two voyages to Lyme Regis for intelligence.

September.—John Cobb, master of the Plymouth post, had 10s. for bringing five prisoners from Dartmouth.

October.—"Item: P[d] Mr. Olliver Ceely and Mr. Geo. Rattenbury ye sum of £20, and is in xtn of such summes as have beene delivered by you in London in follunteering and makeing pvision for ye garrison."

Nov.—Capt. Sampson Crabb had £1 for oversight of the workmen employed in repairing the damage at the outworks, &c. [Some of these repairs were made by the soldiery. There are several entries of payments to Capt. Rows' men.]

Nov.—Item: P[d] Charles Hoppeing for waeges by him disbursed to severall messengers sent to Mooreton and ye army for intelligence, £4 10s.

Paid Christoper Martin for money by him disbursed for intelligence, 5s.

Robert Mann, "for his paines in goeing to Sir Thomas fairefexe at Ottery St. Mary, 40s."

Dec. 15.—Thomas Bolitho received £16 11s. 6d. for monies disbursed by him for materials and necessaries for the outworks, and "for carriadge of amunicon on ye yssueing fourth of the fources of ye garrison into the enemies quarters from ye 6 of 7ber to this day."

Christopher Eaton, apothecary, for "medicines and phisicke delivered for ye sicke soulders of ye garrison, from Feb., 1643, to January, 1644, £10 6s. 9d. On the 20th of January Eaton had also for physic £6 12s. 3d.

Jan. 20.—The last entry in the account is for a payment to Edward Pattesone and Thomas Dalkeinge for "making and tarreinge [evidently a rude kind of waterproofing] capes for ye centinells at ye outworks."

WIDOWS' PETITIONS.

There are yet extant a number of the petitions presented by the widows of men who fell in the defence of Plymouth for relief of themselves and children. I quote an example, and also one presented by the widow of a Royalist after the Restoration. The power of relief appears to have been in the county justices at Quarter Sessions. Other petitions which I have seen refer to Steven Webb and a man named Clarke, wounded at the storming of Warleigh House; one Bloye, slain in the field by the enemy in

the "Sunday's fight" at Lipson; a man killed in storming Fort Arundel; Robert Saggamore, wounded at Mount Edgcumbe, and taken prisoner to Lydford, where he died; and John Pine, mariner, slain in the fight at Pennycomequick, being gunner of the fort, and commanded by Capt. Richard Clarke, who in the said fight, the town being stormed, was likewise wounded.

To the right Hoble the Lords, Appointed Judges for the Western Circuits.

The humble petition of Joan Evens, Elizabeth Ball and Alse Worth, all of Plymouth, in the County of Devon.

Sheweth

That yor poore petitioners for theese many yeares have beene in extreame want, and liued in great misery, by reason theire husbands were all slaine in the late Warre in the defence of this Towne, leaving to each of yr poore petitioners three or foure small children, who are not able to help themselves, neither have any helpe from any others, except from yor poore petitioners wh is very small God knowes. And notwithstanding yor petitioners haue often tymes earnestly importuned the Authority in this place to comiserate their sad and lamentable cases, and to redresse theire grievances and to satisfy the debts oweing from the souldiery which hath undonne yr petitioners, yett all the comfort wee can receive from the Authority heere is they wish it did lye in theire power to helpe vs;

I Capt Arthur Gaye of Plymouth doe hereby certify thse premisses to bee trueth, witnes my hand this 2d of August 1649

ARTHUR GAYE.

The premisses considered and in regard yor poore petitioners seuerall charges are greate, and theire goods expended for the maintenance of the souldyery, the lyues of theire dearest friends lost, and yett noe recompense, yor poore petitioners doe therefore most humbly pray yor Honnors for to represent theire miserable conditione the supreame Authority of this nation as that some releefe may bee ordered speedily for yor petitioners, without which unquestionably they and theire poore chilldren shall perysh for want, and yor petitioners shall ever pray &c

The petition bears the following endorsements—the first on the left hand margin of the face, and the other two on the back:

I desyre the Justics of the peace att theyr next qr Sessns and the to next Justics or either of them in the meane time to take theire order for the reliefe of petr and her chilldren as by the statuts and ordinances of Pliamt is required

3 Aug 1649 Plim-mouth JOHN WYLDE

Plymo the 20th of Agt 1649 I knowe these men to dye in the service of the Pliamnt PHILLIP FRANCIS

I am informed of the truth of this petition TIMOTHY ALSOP Major

To the Right Hon^ble John Earll of Bathe.

The humble peticon of Anne Pomeroy, of Plym^o, widd., humbly sheweth: That Cap^t William Pomeroy, Dec^d, yo^r peticoner's late husband, faithfully serued our late Soueraigne Lord King Charles the first, of blessed memory, in all y^e trubles, as Cap^t of horse against Plymouth, and afterwards as Cap^t of his Maj^ts shipp *St. George* for defence of Pendennis Castle; and upon surrender thereof he was forced to goe for France, and from thence to Jerzie, where hee continued many yeares; and from thence beeing ordered and sent by his Majesty our Soueraigne Lord King Charles y^e second to Scilly to conduct a ship from thence to Jerzey for his Maj^ts Seruice, hee was, in his Course thither, taken and carried in to Plymouth, where hee was keept a long time prisoner.

That upon his Maj^ts happy restoreation yo^r peticoner's sayd husband was made Cap^t of his Maj^ts Friggot *Dolphin*, in w^ch comand hee Dyed, Leaueing yo^r peticoner fiue Children, and in a uerry poore and sad condicion.

The p'mises Considered, yo^r peticon^r doth most humbly beseech y^r Lord^hp to recomend her Distressed Condicion to his Maj^ts Justices of the peace of the County of Devon, to the end that at y^e next meeting at y^e Sessions at Exon yo^r peticon^r may receive such reliefe for the support of herselfe and poore Children as is vsially allowed in such Casses. And yo^r peticon^r shall euer pray for yo^r Lo^hp honnour and prosperitie.

Royall Citadell of Plym^o, Sep^t 22^th, 1671.

I doe recomend the p'ticon^r to his Maj^ts Justices of the peace, and doe desire them, at y^e next Sissions for this County, to take y^e peticon^rs peticon in to consideracon, and to releive her accordingly, I finding the contents thereof to bee true. BATHE.

Endorsed.—Mrs. Pomeroy's peticon. To have 20 nobles as a gratuity.

For the above petition I am indebted to Mr. Brent. The original of the curious certificate which follows is in my own possession.

These are to certifie all his Ma^ties officres : & : louing subiects : to home these p^rsents shall come Ore May conserne that Anddrewe : Medland the bearer hereof was A souldere vnder the Regimente of Se^r henrey Cary in his late Ma^ties Service during the hole time of the Service and was ever faithfull : & : indigent (!) In the Service to the vt most of his power In testmoney whereof I set my hand and seale the 15^th of App 1664

The truth of this certificate I doe beleive and doe recommend him to his Maj^ts Commissioners H CARY

THO: EDWARDS

The certificate is really that of Edwards; but Cary has written in his attestation between the body of the certificate and Edwards's signature.

EXTRACTS FROM PAROCHIAL REGISTERS.

The following notes from the St. Andrew register may be of interest:

1643.—March—137 burials, 14 soldiers; Henry Dewdney, Cavalier. April—8 soldiers. May—3. June—66 burials, 3 soldiers; 33 baptisms; 8 weddings. July—6 soldiers buried. Aug.—Humphry Williams, Cavalier, buried. Oct.—Daniel Duglas, slayne; Edward Oliver, shot to death; 6 soldiers. Nov.—11 soldiers; 27th, John Symons, gent., ensigne; Edward Godsall, gent., cornett. Dec.—2 soldiers without names; Walter Pike, slayne; Richard Reede, slayne; William Skinner, slayne; Capt. James Anderson; 132 burials, 25 baptisms, 6 weddings.

1644.—Jan.—Hart, ensign. Feb.—William Farnbrooke, slayne. Apl.—Several soldiers. May—Richard Bray, slayne; 9 soldiers. June—Several soldiers and troopers; John Webber, slayne; Diggery Parnace, slayne; apparently no weddings. July—9 soldiers; 9th, Col. William Gould. Aug.—Capt. Samuel Palingson; only 3 weddings. Sept.—Henry Tosnall, John Paddon, capts.; Samuel Toft, slayne; several soldiers. Oct.—Lt.-Col. Richard Martyn, Capt. Richard Laharme, Lieuts. Francis Matthews and Richard Moore, William Pyper, slayne; Thomas Barnett, slayne; 126 burials, including 47 soldiers. November—106 burials, including 26 soldiers; 14 baptisms; two weddings. Dec.—141 burials, 43 soldiers and several strangers; 4 weddings.

1645.—January—135 burials, 50 soldiers; 9 weddings; Robert Mudge and Thomas Gammon, Cavaliers. Feb.—129 burials, 24 soldiers; Walter Troute, ensign; Robert Browne, John Vortiffe, Richard Wills, Hugh Collins, Henree Warde, Peter Doble, Michael Wills, G. Wills, Robert Hamley, William Hill, Cavaliers; 19 weddings. March—128 burials, 22 soldiers; Robert Hogg, Mathew Hopkins, John Northcott, William Prout, Walter Weeks, *Katherine* Trevanion, John Arundel, George Smale, Cavaliers. April—110 burials, 32 soldiers; John Purston, ensign. May—51 burials, 13 soldiers; Capt. Hugh Sampson; Walter Luke, Cavalier. June—57 burials, 4 soldiers; Anthony Treweeke and William Hendra, Cavaliers. July—43 burials, 11 soldiers; Edward Brammycome, William Hobbes, Oliver Harris, Cavaliers. Aug.—20 burials, 2 soldiers; Capt. Ellinsworth (from the Siege Accounts, under date

July, we learn that he had been lately redeemed with George Shoreland out of Lydford Prison).

The Revds. E. Polwhele, B. W. S. Vallack, F. T. W. Wintle, T. C. Coulthard, and Merton Smith, were kind enough to search the registers of their respective parishes—St. Stephen's by Saltash, St. Budeaux, Maker, Plymstock, and Plympton St. Mary for me, but with very little result. The only register that contains any references to the Siege is that of the last-named parish. In February, 1643–4, there were buried John Turlow, lieutenant; John Bromely and William Groves, captain-lieutenants. The other entries refer to soldiers.

THE PSYCHONOMY OF THE HAND.

ABSTRACT OF MR. R. W. WOOLLCOMBE'S PAPER.

(Read December 17th, 1874.)

ABSTRACT of review must be here most imperfect, from its necessary limit; the work containing ninety pages and thirty-one tracings of hands, without the reproduction of which, here impracticable, it is impossible to do even a semblance of justice to its author. It consists of an exposition of the treatises, founded on observation of living hands, of Messrs. Desbarolles and D'Arpentigny, and of similar study for, he says, twenty years by the author Mr. Beamish; "The Form of the Hand; or, Chirognomy," having been the subject of M. D'Arpentigny, and "Chiromancy; or, The Influence of the Mind on the Lines of the Palm," the pursuit of M. Desbarolles; the former having originally taken up his subject from noticing that in arithmeticians, geometricians, and mechanics, and persons with a predilection for the exact sciences, the fingers presented at the joints a knotty appearance; while, on the contrary, the fingers of artists, poets, and of those given less to action than contemplation, were usually smooth, and devoid of the above appearances. The sense of touch in the extremities of the fingers more especially, and in a less degree in the feet, has been shown by Meissner to depend

on a greatly more elaborate development than on the surface of the body generally, and that, while by this may be perceived only pressure and temperature, from the former are further conveyed to the brain the conception of form, size, weight, and local position.

To trace a living hand correctly on paper, it should be laid flat, and the tracing made with a Mordan's pencil. The lines of the hand may be then drawn by the eye. As in brute animals the greater portion of the whole hand is formed by the palm, so in proportion in man, as the palm dominates over the fingers, may the nature be deemed to partake of animal nature, due consideration being given to its consistence and thickness, as well as relative size, various qualities attaching to the large and small palms, hard or soft, flexible or inflexible, elastic or non-elastic, hollow or flat. It has been already indicated, as to the fingers, that with smooth fingers may be associated inspiration, intuition, passion; in the knotty fingers, induction, order, and arrangement. The ends of the fingers are also highly characteristic. They may be spatulous (or spread out), square, oval, or pointed. With the *spatulous* are indicated corporeal agitation, locomotion, and manual occupation; love for the industrial and mechanical arts, and constancy in pursuit and in affection; but no feeling for the higher philosophical and metaphysical sciences, no love for spiritual poetry or for speculative pursuits.

The *square form* is the index of precedent, custom, and routine; of a love for the moral, political, and social sciences; of didactic, analytic, and dramatic poetry; of grammar, geometry, metre, rhythm, symmetry, and arrangement; for art *defined*. It is a form general in England, said to be derived from the Normans, as the spatulous from the Saxons.

The *conical and pointed finger* indicate widely-opposed habits of thought and feeling to either of the two just described. The artist now takes the place of the artisan; labour, regularity, and social order give place to *insouciance* and contemplation, enthusiasm and personal independence. Sculpture, monumental architecture, poetry, painting, and song, find in the conical fingers their votaries, the beautiful and romantic their worshippers. "It is worthy of observation," says M. D'Arpentigny, "that everywhere the Protestants as a people excel the Roman Catholics as a people in the mechanical arts, and are excelled again by the Roman

Catholics as a people in the fine arts, not because they are Protestants, as some are disposed to think, but because of their peculiar organization. In Italy, France, Spain, and Ireland, Catholicism, with its mysteries, its poetry, and its art, retains its hold upon the conical type; while in England, North Germany, and Holland, where the spatulous and square forms abound, with their restless action and rigorous logic, Protestantism prevails." Mr. Beamish, however, observes that the above must be accepted but in a broad and general sense, and open to some modification. The thumb, in relation to the other fingers, is deemed to be of the first consequence; if feeble, so also is the character, and *vice versâ*. The end phalanx especially should be long and strong. Galileo, Descartes, Newton, Leibnitz, Condillac, Kant, and other profound and original thinkers, were endowed with large thumbs; so also Voltaire, as seen in his statue by Houdon, a cast of which is at Sydenham. Space does not permit extended detail. It may be mentioned that the three principal lines in the palm; viz., of Life, of the Heart, and of the Head, are respectively those at the root of the thumb, tranversely below the three inner fingers, and the third line transversely between those two lines. The tracings of hands in the work indicate the accordance with their sufficiently-known character of the relative development of those lines and the other points before mentioned in several individuals of note—the late Mr. Brunel (whose biographer Mr. Beamish also has been), Lord Brougham, Dr. Whewell, Miss Helen Faucit, and others. In the unavoidable absence of these tracings here, it is impossible to convey adequately what by enlarged reproductions of them at the lecture was illustrated.

NOTES ILLUSTRATIVE OF SPECIES DISTRIBUTION ABOUT PLYMOUTH.

ABSTRACT OF MR. T. R. A. BRIGGS'S PAPER.

(Read January 14th, 1875.)

One of the most interesting subjects connected with the theory of Charles Darwin is "the struggle for life." In his justly-celebrated work, "The Origin of Species by means of Natural Selection," he has carried the subject into detail in his accustomed masterly manner, dealing both with facts illustrative of a contention between different species, as well as with those showing an internecine conflict among the individuals of each one. I am persuaded that the recognition of the existence of a warfare of species in the animal and vegetable kingdoms throws a flood of light on many facts in both, and often helps us to explain what otherwise we should find inexplicable, especially if we at the same time keep in view the co-existence of a wonderful interdependence of species in the realm of nature. These two subjects I shall now endeavour to illustrate in some notes on local natural history phenomena. I take them together, as they become closely connected when our range of view comprehends numerous and diverse organisms, since the warfare carried on between any two species often greatly influences the range of a third. As I made mention just now of Darwin's remarkable work, and moreover, as he has in a measure woven these subjects into his theory, it may be well for me to state that I am not going to attempt either a defence or refutation of it, so far as the question of evolution of species is concerned; all I shall endeavour to do will be simply to illustrate *two subjects* that happen to form links in his chain of arguments, by bringing forward a number of facts in our local natural history which have come under my personal observation, having all a more or less intimate connection with one or both of them. As regards the interdependence of species, we must see that man has done

much to influence the range of both animals and plants, even if we put aside all the direct and intentional works of his carried on in each direction. Every interference of his with the natural order of things produces effects that extend far beyond his intentions, nay, that are sometimes opposed to his desires. The cereals he takes with him from place to place always bring with them a host of weeds of a certain kind, whilst his sheep carry in their wool the seeds of other strangers. Several species follow his footsteps, seemingly only because the soil acquires a special fitness for supporting them *after* he has come into contact with it. It is easy to see how from plants this influence of his must extend to animals and insects, and do much to control their range and regulate their numbers. He cannot bring a few yards of common into cultivation, or fell a small grove of trees, but the work must favour some animals and vegetables, and prove as much to the loss of others, owing to the complexity of the relations between species in the world of nature, to the interdependence and warfare existing between so many. Even a footpath across a field will often induce a peculiar vegetation on each side: and here we find such species as the swine's cress (*Coronopus Ruelli*) and the common knot-grass (*Polygonum aviculare*), plants having wiry stems that lie comparatively flat on the surface, so consequently they are well fitted to resist the pressure of a passing footstep, though not formed to compete successfully with the grasses constituting the matted sward of the contiguous old pasture land.

In numerous cases the entire dependence of certain species on others for power *to exist* is clear. Many animals could not live were those weaker ones on which they prey destroyed; and we know that the parasitic insect that infests a certain bird owes to it its nutriment, its necessary amount of heat, and its hiding-place. On turning to the vegetable kingdom, we, by saying the mistletoe, the dodder, the broomrape, and many other plants, are parasitic, acknowledge likewise their dependence on other species for their support. When we see too the minute vegetable productions comprehended under the words mildew and rust clustering on or investing larger and higher organisms, it is clear they would find no place for development were these latter destroyed.

There are plants whose distribution appears so extremely arbitrary that the botanist can only conjecture why *this* grows *here* and *that* grows *there*. We, in our ignorance, on seeing a plant growing in a

particular place, are too ready to conclude it is there because it finds the spot best adapted to its requirements, so far as soil and like conditions are concerned, when after all there may be no such special adaptations existing. In our own lovely Plym Valley we find diminutive specimens of *Ranunculus parviflorus*, *Teesdalia nudicaulis*, *Lepigonum rubrum*, and *Trigonella ornithopodioides* growing on the refuse thrown out from the quarries of Cann and Rumple, yet we know they all would attain larger size in a deeper soil; but here the surrounding country is so occupied by oaks, brambles, and strong-growing herbaceous plants, that it affords no place for them, so the conclusion seems forced on us that the comparatively minute and weaker forms have been driven to the spots we see them filling.

Again, we have a wild garlick (*Allium oleraceum*) growing sparsely on the limestone beds to the east of Plymouth, lying between the Plym estuary and Plympton and Elburton on the east. It is not known elsewhere in Devon or in Cornwall, and we might at first be led to suppose that there exists some principle in the soil of the locality indicated specially suited to it; but having some years ago removed a root or two to a small garden in the northern part of Plymouth, where the substratum is Devonian slate, I have since had the conclusion forced on me that there is no special connection between anything contained in the limestone soil and the plant; for the garden specimens have attained a luxuriance far beyond the wild state, and have shown an enormous rate of increase through the bulblets formed on their heads. Yet this is a plant that in its native condition on our limestone beds seems not to have at present the power of increasing as a species or enlarging its area, year after year about as many specimens sprouting up on the old wall or grassy bank. Probably it is a difficulty in maintaining its ground against others better able to adapt themselves to surrounding conditions that keeps it thus local and sparse. The facts just given respecting this garlick pointedly illustrate the following remarks of Darwin: "If we forget for an instant that each species tends to increase inordinately, and that some check is always in action, yet seldom perceived by us, the whole economy of nature will be utterly obscured."*

Bearing in mind the increase of the allium when it was freed from other plants, we may see how much man in gardening opera-

* "Origin of Species," ed. 6, p. 297.

tions benefits any species he tends simply by giving each plant a much larger space of ground than it would have had to itself in a wild condition. Indeed we know, however rich he may make the soil, his seedlings will form but weakly plants if he allow them either to grow up thickly together, or to become choked by weeds; the stronger killing the weaker, till, by a process of natural selection, or, as Mr. Herbert Spencer would say, "the survival of the fittest," only the most vigorous remain at last to bear seed, though with powers weakened by the contest that they have had to carry on.

When we see how every available inch of ground is appropriated by one form of wild vegetation or another, and bear in mind that notwithstanding this there are recently-introduced weeds which are rapidly becoming common, it is apparent that in some cases these intruders can only have obtained their footing through dispossessing other species of the ground they now occupy. Buxbaum's speedwell (*Veronica Buxbaumii*) is now as common in cultivated fields in our neighbourhood as either of the two closely allied field speedwells, *V. agrestis* and *V. polita*. Yet so comparatively recently as 1841 the Rev. W. S. Hore wrote of it (in vol. 1 of the "Phytologist"): "Occurs both in Devon and Cornwall, but not abundantly. It appears limited to the fields which have been recently ploughed, and disappears in a season or two." Occupying as it does just the same spots as *V. agrestis* and *polita*, it must since its introduction have had much to do in controlling the numbers and checking the increase of each; and the contention now going on in our fields between these three closely allied speedwells may be considered to furnish a striking illustration of the following remarks of Darwin: "As the species of the same genus usually have, though by no means invariably, much similarity in habits and constitution, and always in structure, the struggle will generally be more severe between them, if they come into competition with each other, than between the species of distinct genera."*

The common sallow (*Salix cinerea*) affords a good example of a species possessing a great power of increase through its capability of adapting itself to very diversified conditions, and its having its numerous seeds furnished with down, fitted for carrying them over a wide surface and lodging them in all kinds of situations, so that, although it is pre-eminently a shrub of the swampy woodland valleys, it helps to form many a hedge-row, be the situation moist

* Page 59.

or dry; is common in bushy waste spots, and sometimes will actually arise as a stunted little bush from the crevice of a dry wall, as I have seen it doing in the northern part of Plymouth. In connection with the interdependence of species, I would here observe that I have been struck with the wonderful economy in the ordering of nature by noticing how many are the creatures benefited by only a single large bush of this sallow, or of the nearly allied *Salix caprea*, when covered with catkins in the early spring. On it we may see two or three of the glorious peacock butterfly (*Venessa Io*) and as many of the small tortoise-shell (*V. urtice*) that have hibernated through the previous winter, several bees of two or three species, and dozens of flies of various sorts and sizes, whilst the latter often attract a newly-arrived chiff-chaff, which in the pauses of its simple song darts after them among the branches, making the whole host to arise from their sweet feast in quite a cloud; then the whole settle again, and continue their meal until the little bird has another chase through the attractive bush, and once more throws all the busy throng into confusion.

The beech (*Fagus sylvatica*) possesses in a remarkable degree the power of extending itself as a species, through its being able to maintain a successful warfare against most other trees, and this probably by reason of its greater capacity to grow vigorously in crowded situations. We often see it when young pushing its way through a dense thicket, and may feel almost certain that ultimately its lithe branches will surmount every obstacle, and, moreover, form masses so dense as literally to throw all the arboreal vegetation around into shade. Think, when a mighty tree of this species is felled, what dozens of long-dormant seeds of various species will be ready to spring into life through the admission of air and light to the ground it covered! and see here another illustration of that great fact in nature, the warfare of species.

Many plants are greatly kept in check by being much sought after by certain animals for food. Perhaps the closest grazing quadruped we have is the common rabbit, and I have generally found turfy spots that it much haunts yield but a small number of species, owing probably to very few being able to resist its close nibbling. Sheep also on our commons will make turf very bare; and I believe it is they that cause the ling and heath to appear in such well-defined patches as they often do. Probably many of the

grassy trackways on Dartmoor, with a vegetation considerably different from much of the adjacent surface, have been formed by sheep and cattle that have frequented these spots, whose repeated croppings the heath, ling, and some of the coarser moorland grasses have been unable to withstand, so that a way has been opened for the appearance of a different set of plants more fitted to bear the constant croppings, and constituted to profit by the manure deposited by the animals.

Having very briefly touched on the influence of some animals on plant distribution, I will now bring forward a few facts illustrative of the work of insects in the same direction.

Sir John Lubbock, in his remarkable lecture delivered at Belfast during the last meeting of the British Association, observed, "Whilst every one knows how important flowers are to insects, but comparatively few are aware on the other hand how much flowers themselves are dependent on insects," and went on to speak of the remarkable ways in which several species are fertilised or crossed by bees and other insects. Bearing these remarks in mind, a field of red clover (*Trifolium pratense*), profusely in bloom, with dozens of humble bees and a sprinkling of painted lady, or clouded-yellow butterflies passing from head to head extracting honey, has a new interest both for the botanist and entomologist, since the first feels he would like to know something about the insect which fertilises the clover, and at the same time the latter becomes desirous to learn particulars respecting the plant that supplies these insects with their food. The agriculturist, too, should feel interested, since in Australia—whither the clover has been brought, but the insect that fertilises it exists not—it does not produce any seed; this, therefore, has to be imported for every fresh crop, as is likewise the case with the common scarlet bean. Darwin believes that with us the clover is rendered fertile by humble bees, observing that the honey bee has too short a proboscis to reach the nectar. Remembering this statement, it was with some surprise I noticed one day in August last numbers of both honey and humble bees gathering from its flowers in a field near Port Wrinkle, in the parish of Sheviocke. Careful examination of some heads that honey bees had left showed that their flowers had been bitten through near the base of the corolla-tube, evidently in order to the extraction of the honey through the orifice. Humble bees very commonly, though not invariably, obtain honey in this way from

such flowers as those of the jasmine and the greater snapdragon. I say *not invariably*, as I have often seen them passing down the throat of the corolla in *Antirrhinum majus* to reach it, notwithstanding the closing on them of the elastic lip of this flower with some degree of force whilst they were so doing. This variation in the practice of individual insects in pursuit of the same end is an interesting fact, especially as I believe bees of the same species follow the both plans, an opinion in which I see I am supported by Dr. Ogle, as quoted by Sir John Lubbock. I am doubtful if honey bees ever bite holes in flowers in gathering honey, and consider those at Port Wrinkle were only using the holes previously made by the larger wild species, which Darwin says he has seen them doing; so that here we have a very curious instance of the dependence of one kind of bee on another for the obtaining of any food from a certain plant, and a good illustration of an interdependence between species. Were all bees to gather their honey through *bitten* holes instead of by creeping between the organs and exploring the recesses of flowers, they would not do nearly so much in rendering plants fertile as is now the case, since in numerous species they would secure the nectar without bringing their bodies into contact with either stamens or pistil; moreover such a procedure would be to the additional loss of the plants through its removal lessening the chance of their fertilization by moths, etc.

Darwin has conclusively shown that some plants are absolutely dependent on certain insects for the transference of the pollen to the stigmatic surface; so it is manifest that the presence or absence, abundance or scarcity of such insects in a district must influence the range and numbers of these plants. Nor can we stop here if we keep in mind the contention between different vegetable species for the possession of the ground; for then we must see that this means conversely less or more of those *other* plants with which the insect-fertilised ones are in closest conflict. As regards the British species of the genus *Orchis*, of which we have five in our neighbourhood, Mr. Darwin considers their fertilisation depends almost exclusively on moths, and says he feels almost certain bees do not *habitually* visit them, although he has had evidence that they will *sometimes* do so in a hive and a humble bee sent him by Professor Westwood with pollinia from their flowers attached. I have myself caught a very large humble bee, between Plymbridge and Plympton, with no less than four pollinia of *Orchis mascula*

stuck to its face; still I am not in a position to question this statement, that moths are the *principal* agents in the fertilisation of these plants. He says that in Listera the work is generally done by small hymenoptera; in Spiranthes by humble bees. I do not think bees when gathering honey so commonly confine themselves in each journey to a single species, as some writers favourable to Darwin's views are willing to suppose.

Birds often help plants, especially berry-bearing ones, to spread to spots they would never reach without their aid. In May last a convincing proof was afforded me of the readiness with which the seeds of the gooseberry vegetate when deposited by birds, through my finding no less than half a dozen stunted little bushes growing on top of a high garden wall at Plympton; and here were also a little currant bush, two hawthorns, a seedling from an introduced species of berberis, and a small plant of asparagus; all probably sown by birds, since *they* only would be likely to bring the seeds of all these to such a situation. The missel thrush, or holm screech, as our country lads call it, is, like most of the thrush tribe, a great devourer of the berries of several plants, and it is a well-known ornithological fact that this bird has increased greatly within a comparatively short period. Though now a *common* bird, Col. Montagu, in his "Ornithological Dictionary," published in 1802, speaks of it as by no means plentiful.

Let us turn to another bird, the common starling. Forty years ago, when Dr. Moore compiled his paper on the "Ornithology of South Devon" for that early volume of our own "Transactions," and "Loudon's Magazine," he could only say of this bird, "Common here *in winter;* arriving in October, and departing in spring," adding, as something out of the common, "but some few of them have been known to breed at Haldon, the seat of Sir Lawrence Palk." Fifteen years later it had extended itself as a resident species considerably more to the west; and at the present day we have this bird nesting in our neighbourhood in considerable numbers, so that last spring it was no uncommon thing to see daily many individuals passing into the town with food for their young, collected from the adjacent fields. It is notorious that an amazing number of grubs and other insects are devoured by this bird; and in the breeding season its destruction of them must be great indeed, so that its presence with us then must act as a check on the species forming its food, yet it is one that scarcely existed here

thirty years ago. Some other small birds, amongst which are the willow wren and gold crest, are more plentiful at the present day than they were fifty years since, to be accounted for perhaps from the wholesale destruction of certain rapacious birds by game preservers, and the spread of plantations supplying them with additional food and shelter. To all who love Nature, the increase of such pretty species must be a subject of gratification; but, the consideration that it has probably in a measure been brought about by the destruction of other interesting and, from some points of view, very valuable birds, must cause regret. Numerous are the complaints we now hear from agriculturists of extensive injury done to the clovers and other fodder plants in winter and early spring by flocks of wood-pigeons, as also of great loss consequent on the destruction of various products by hosts of rats, infesting the homesteads, granaries, and even the very fields. It requires no clearness of vision to see how this has come to pass if we bear in mind that during the past fifty years countless numbers of hawks, owls, pies, and weasels have been destroyed by game preservers; so that some species have been quite exterminated, and others greatly reduced in numbers. Should any Plymouth ornithologist now be so fortunate as to obtain a sight of a peregrine falcon sailing over one of our cliffs he would think the fact worth recording in the next number of the "Zoologist," whereas Montagu in his day was able to say, "This species appears less plentiful with us than it really is, there not being any part of our coast from north to south where the cliffs rise to the height of three or four hundred feet but they are found scattered during the breeding season. The so-called common buzzard, too, is now rarely met with in our neighbourhood, so that I consider it quite an event in my "ornithological experiences" to have had one day last summer the pleasure of seeing a bird of this species performing graceful evolutions high in air whilst harassed by a kestrel.

The lessened numbers of the order *Corvidæ* may have had more to do with the increase of some of the smaller birds than has the destruction of so many of the *Falconidæ*, for it cannot be denied that some of the first, such as the magpie and jay, are great plunderers of the eggs and young of other species; and the jay may be regarded as one of nature's most effectual checks on an undue multiplication of such species as thrushes and finches, for when a pair have a brood of five or six hungry nestlings to provide for, no

schoolboy is a more diligent nest-hunter than are these pretty and amusing birds, although it is by no means exclusively on such fare that the young are reared, for the species is well-nigh omnivorous. Many years ago, I happened to discover an article of their food in the following way: A brood of young ones had just quitted the nest, when, to my regret, some fell victims to a sportsman's gun. These I had an opportunity of examining, and was greatly surprised to find the old ones had been feeding them on the small semi-transparent galls so common on the leaves and young branches of the oak. The jay, in common with the rook, wood-pigeon, and pheasant, is known to be a devourer of the fruit of this tree—a fact to which the name of *glandarius*, bestowed on it long ago by Brisson, points—but I have never met with any statement of its eating oak-galls in any ornithological work. Who would have supposed the number of jays in a district could have had any relation to that of the oak-galls, or that a minute species of cynips could have been an instrument in making the king of the forest yield them food!

Our favourite cuckoo has to be considered as one of nature's agents in diminishing the numbers of some of the smaller birds. A young cuckoo, directly after it is hatched, turns out the nestlings of the foster species to perish. We are lost in wonder that an instinct, apparently so cruel, should have been implanted in the species; but on viewing it as one of nature's plans for preventing the undue increase of certain birds, we are able to see it in a somewhat different light. The famous Dr. Jenner seems to have been the first to give a detailed account concerning the way in which the young cuckoo ejects the newly-hatched nestlings of the foster species; and his statements were, not long after, confirmed by that admirable Devon ornithologist Col. Montagu. I can myself give the following particulars with reference to the matter: When crossing Crownhill Down, on July 9th, 1867, I happened to see a meadow pipit, or titlark, as it is commonly called in our neighbourhood, fly up from the common, and I soon found her nest, with a newly-hatched cuckoo within it, perfectly bare of feathers, whilst on the edge of the nest was a little living pipit quite as young, which had evidently been recently turned out of it. I put it back into the nest to see how the little cuckoo would act, and it soon began to do its utmost to eject it. Two or three times it succeeded in lifting it to the rim of the nest, and tried to throw it out; once

it jammed it between itself and a stump of dead ling sticking up outside, elevating its own body with its burden on top by driving the tips of its wings and its hooked tenacious claws into the fabric of the nest. It did not effect its purpose while I watched it, for perhaps over half an hour, on account of the bunches of ling and tufts of grass around those parts of the nest to which, unfortunately for itself, it happened to bring its burden. So much was the nest enclosed, that the only place where it was likely to have succeeded in throwing it out was at the spot where I found it at first. The instinct of the young cuckoo shown in ejecting the nestlings of the foster species is one so wonderful that Darwin has considered it a fit subject for special remarks when combating objections to his natural selection theory. The facts concerning the young cuckoo capitally illustrate the warfare and interdependence of species at the same time, for, whilst warring against the foster species in the aggregate, it is yet dependent on individuals among them for its power to exist as a species.

Our native quadrupeds are so few that a great number of cases illustrative either of species warfare or species interdependence could not be brought forward with reference to them. This class however furnishes us with one striking instance of the general diffusion and rapid increase of an introduced species causing a widespread and general decrease of a congenerous native one. I allude to the Norwegian, and now common, rat, *versus* the old English, and now extremely rare and local, black rat. I was greatly surprised to find, from a statement in an interesting article in the "Zoologist" for April last, contributed by one of our members, Mr. Francis H. Balkwill, that the black old English rat still exists about the Messrs. James' Starch Manufactory at Sutton Road. It would be of great interest to find some reason for its long continuance in this spot.

The introduction of so many foreign plants and shrubs into our gardens and pleasure-grounds has doubtless increased the numbers of certain insects, and probably birds also, as many of these aliens furnish food for both. Amongst insects the death's-head hawk moth (*Acherontia Atropos*) has probably benefited as a species by the very general cultivation of the potato; for it is on this American plant that the caterpillar most frequently feeds, though sometimes on *Lycium barbarum*, a common shrub from N. Africa, or else on the jasmine from the East, and, what is remarkable, only comparatively rarely on any indigenous plant.

The beautiful larvæ of the privet hawk moth (*Sphinx Ligustri*) are quite common in gardens in our town, where they feed mostly on the privet, lilac, or laurustinus, though in the country districts around I have found them generally on the ash. That they should eat indifferently the ash, privet, or lilac is not to be considered a matter for surprise, since they are all allied species belonging to one order, *Oleaceæ;* but that they should be often found also on the foreign laurustinus, a species of viburnum, one of the order *Caprifoliaceæ*, may well be considered remarkable, especially as this is frequently the case when privet or lilac bushes are growing close by. Their feeding on this introduced, but now very common, shrub has probably proved to the benefit of the species, and led to its increase here.

The extensive diffusion of the numerous varieties of cabbage, with the other varied progeny obtained by the art of the horticulturist from *Brassica oleracea*, as also of turnips, mignonette, and two or three species of *Tropæolum*, has doubtless been greatly to the advantage of two of our common white butterflies (*P. Brassicæ* and *P. Rapæ*), whose favourite food-plants these now are. The little parasitical ichneumon fly too, that does the gardener so much service by destroying an immense number of the caterpillars of the first, has probably greatly increased through having had abundant store of food supplied for it when in its larval state by the bodies of the living caterpillars.

A great deal has been said lately on relations existing between colours in flowers and the visits of insects to them, the flowers being supposed to attract the insects by means of their *bright* or *clear* colours, so as to secure their own fertilization. Their odours, too, have very reasonably been regarded as another lure, such as are emitted in the evening or at night, appearing designed to secure the visits of moths, the larger number of which feed only at these times.

We often hear a great deal about the all-pervading quiet and repose of Nature; but how much is there in such a view of the world around us that is in reality opposed to simple fact and plain scientific truth! Poets generally have done so much to picture it to us as one untroubled scene of calm repose and tranquillity that it seems almost to have been reserved for the most popular poet of our own day to sing of it in another strain, and so great is the contrast that he seems absolutely to startle us when he passionately exclaims—

"——— Nature is one with rapine, a harm no preacher can heal;
The May-fly is torn by the swallow, the sparrow spear'd by the shrike,
And the whole little wood where I sit is a world of plunder and prey."

Still, in the words of Darwin: "When we reflect on this struggle, we may console ourselves with the full belief that the war of nature is not incessant, that no fear is felt, that death is generally prompt, and that the vigorous, the healthy, and the happy survive and multiply." There is some consolation here, but more when Faith's eagle-eye is so clear as to see, from the beams breaking through the mists around, that all at length will be clear; that warfare will be over; that peace *will* come, since divine love *must* conquer and prevail at last.

CALIFORNIA.

ABSTRACT OF MR. CHARLES OXLAND'S PAPER.

(Read January 21st, 1875.)

The name California is accounted for as having been applied by one of the Spanish commanders, Fernando Cortez, to the peninsula of Lower California; as Cala-y-fornaz, bay or cave, and furnace; or Calida fornaz, hot furnace.

The Spaniards had prepared a map of the coast as far north as lat. 40° thirty years previous to Sir Francis Drake's visit in 1596, showing the points at which they had touched.

The lecturer concluded an account of the habits and customs of the early missions by remarks on the subjugation of the Indians, probable descendants from Japanese whose vessels had been wrecked on the coast; the use made of them as agricultural workmen, and in the manufacture of woollen articles; and, further, an account of the abuses by the Padres that led to the breaking up of the missions, through their selfish conduct towards white immigrants.

The population by census returns in 1870, 628,000 whites, 60,000 Chinese, 5,000 negroes, 7,000 Indians; in all, 700,000. Of this number, 200,000 engaged in agricultural pursuits. Total

yield of wheat from harvest in 1874, 31,000,000 bushels; surplus over home needs, 700,000 tons.

The dryness of the climate necessitates canals for irrigation, several of which are building, one to run a distance of 125 miles through the great San Joaquin valley, 52 feet wide and 6 feet deep; grade, one foot to mile.

Exports of wine and brandy for 1873, 900,000 gallons, or 867,000 gallons wine, 110,000 gallons brandy. Many varieties of the eucalyptus are being largely planted—the *Eucalyptus undulatus*, of which four varieties are being used—the red, white, and stringy bark—as ornamental and forest trees; the swamp variety in wet soil, on account of its drying action on the soil, thereby reducing the danger of malaria. The *E. globulus*, or blue gum, and *E. pepperita*, both with fragrant leaves, are much used for ornament in dry soils.

The lecturer argued that the Greenback now excluded from California alone, would be injurious, because a large surplus of the agricultural yield must be for some time sent to countries having gold as the standard of value. Whatever these staples, therefore, are worth in gold in California for shipment, determines the value of the entire crop; the price of the whole depends on the value of the surplus exported. Articles produced and consumed within the country are measured by home currency—paper money—and are necessarily greatly advanced in price, because the currency is greatly expanded; and it is an accepted principle that general prices depend upon the quantity of the existing currency. For this reason all the farmer purchases from home manufacturers is much enhanced in value, whilst his products in the main remain at their former prices.

Mining interests would be affected by the currency thus. Gold and silver are wanted throughout the commercial world for use as money. The greater the demand, the greater the value; therefore anything which tends to diminish the demand reduces the value. Gold and silver being only wanted for payment of duties at customs, and interest on the national bonds, the quantity necessary to banks would be small; therefore they must be exported, and sold for what they are worth in other countries. The result is to lessen their value. For example, boots and shoes, which in 1860, when the currency was at par with gold, could be bought for $3, are now worth $4.50. The miner, therefore, pays 50 per cent.

more for his boots, and loses the difference, because he can obtain his gold with no less labour than in 1860. He cannot water his gold, as the government do the currency.

The topography of the state was explained by a map on which five equidistant parallel lines were drawn, having a direction N. 31° W. across the map, and 55 miles apart, the middle line drawn along the western base of the Sierra Nevada, from Visalia to Red Bluff. The first parallel east of this passes through or very near the highest points of the Sierra Nevada; the next parallel line east of this crosses a series of depressions occupied by lakes and deserts full of geological interest, including the celebrated Pyramid, Walker, Owens, and Mono Lakes, and Death Valley, the last 100 feet below the level of the sea. The first line west of the central one follows closely the eastern base of the coast range from near Kern Lake northward for 300 miles; the second line west, and last parallel line, represents very nearly the coast line of the Pacific, or the western base of the coast ranges.

These lines divide the state into four belts, which preserve their main physical features over about five degrees of latitude, and for a distance of 400 miles, which embrace the whole of the agricultural, and by far the most of the mineral districts. These belts were designated, naming them from the east to the west, the eastern slope of the Sierra Nevada, the great Californian Valley, and the coast ranges.

Two lines were drawn at right angles to those just mentioned, giving divisions of southern, central, and northern.

The coast ranges, so called from their proximity to the coast, form when seen from the sea an almost unbroken wall rising directly from the water, consisting of a number of chains or ranges, known under separate local names. They are generally much inferior in height to the Sierra Nevada, although culminating points rise to a height of 8,000 feet.

These chains or ranges, each nearly distinct, are all connected, with the exception of the peaks which form the outlet of the great central valley at the Straits of Carquinas and the entrances to San Francisco Bay. Both north and south of this each separate chain, after being separated from its neighbour by a valley, joins some other chain lying nearly parallel, the whole system joining topographically with the Sierra Nevada at either end.

Geologically, the coast ranges are not known to contain any

strata older than cretaceous, tertiary and cretaceous rocks being in the whole of that examined by the Geological Survey, and by private parties so far.

Both of the formations more or less metamorphosed, and much distorted since their deposition. Volcanic and granitic rocks occur; but neither forms a conspicuous part of the system as a whole.

The system, believed by many, does not extend farther south than 33°, nor farther north than 42°, or almost entirely within a length of 550 miles. On either side of this they are feebly represented, and apparently die out at these limits. In breadth remarkably uniform for over 300 miles; but each side of the middle they swell out to sixty miles or over. Changes of level have taken place down to very modern times.

Hot springs are numerous, occurring along nearly the whole length of the chain, and in many of the ranges.

Quicksilver found almost throughout the coast ranges in the metamorphic cretaceous rocks, gold being also obtained from the same source in the Cimiabar.

Silver also lately found in these ranges, and with copper, tin, iron, sulphur, manganese, antimony, asphaltum, and mineral oils, will make their exploration of great value in the future.

In an account of some geological rambles in the coast range, Yosemite Valley, and Sierra Nevada, the lecturer described the main features met with in passing from the sea to the tops of the Sierra Nevada, or across the mountain systems at right angles.

In remarks on the coal found in the cretaceous system of the coast ranges, mention was made that the coal, like all other of a later geological period than the true carboniferous, contained a considerable amount of water (14 per cent.), which is driven off in drying. The analysis given was:

Water	14·07
Bituminous substances . . .	33·89
Fixed Carbon	46·84
Ash	5·20

The sources of gold divided into three distinct classes.

1st. Auriferous veins most frequently enclosed in metamorphic slates.

2nd. Deposits of alluvial gold occupying the beds of ancient rivers.

3rd. Deposits in which the gold of ancient river systems have been re-distributed by modern streams.

Veins containing a considerable amount of metallic sulphides, particularly iron pyrites, the most auriferous.

The auriferous gravels of 2nd class, vary in thickness to 120 feet, a common depth; and when, as sometimes the case, protected by a capping of basalt, their thickness not unfrequently exceeds 250 feet. One half of the gold of the country being produced from these deposits.

The auriferous quartz, the principal source of gold, is enclosed within the slates and other metamorphic rocks. These masses of slate form a belt having a length of about 300 miles, and an average width of 50 or 55 miles, and have sandstone on either side of them to the east and west.

Passing off the sandstone on to the granite of the Sierra Nevada, in which is situated the Yosemite Valley, a description of some of the distinguishing features of this locality was given; the approach to verticality of its walls; next, their great height (3,300 feet), not only absolutely, but as compared with the width of the valley (half a mile); and, finally, the small amount of *débris* or talus at the bottom of the walls.

The characteristics of the granite masses between the Yosemite Valley and the Mono Basin, were described as showing remarkable effects of glacial action in times long past. The living glacier of Mount Lyell, 13,700 feet above the sea level, was mentioned as being on the northern slope of that mountain; the rate of its travel being somewhat faster than that of the Swiss glaciers.

In the Bloody Cañon, or Mono Pass from Lyell Meadows, masses of slate were met, with a dip towards the axis of the chain, which became highly altered about two-thirds from the top of the pass; the stratification nearly obliterated, the rock being occasionally porphyritic. One mile east of this, and lower down the mountain sides, granite is again met with and continues to the foot of the pass; a finer grained variety than on the western slope of the Sierras, and of a light rose-colour, largely made up of quartz.

Traces of ancient glaciers were abundant from near the summit to the foot of the pass. The rocks, rounded, polished and grooved, bear evidences of immense pressure against the walls where the cañon is high and shut in; the structure of the rock being changed as if by the crushing and closely compacting together of the

mineral of which it is composed, so that a crust is formed sometimes as much as half an inch thick. This crust is more durable than the body of the rock, and, as the granite weathers, it scales off, sometimes in large flakes with a highly-polished surface on one side.

Mono Lake, one of the most remarkable in the State, fourteen miles wide from east to west, and nine long from north to south, had many well-defined terraces around its shores, one very distinct, being 385 feet above the water. The water is of high specific gravity, and intensely saline, containing borax, common salt, and carbonate of soda.

Several islands are composed of volcanic material, hard black basalt, scoriæ, cinders, and stratified ashes. Steam and hot gases escaping from the orifices of many of the fumaroles make considerable noise, and leave thin incrustations which appear to consist of chloride of iron.

Myriads of sea gulls resort to this lake to breed during the summer; but the water is destitute of life, with the exception of the larvæ of a small fly, which occurs in immense quantities, and, when dried, furnishes food to the Indians of the region.

A chain of volcanic cones stretches south from Mono Lake in a north and south direction. Obsidian and pumice abound on the top and sides, and extend over the plain beneath.

At the summit, and within the cone of one of these, several boulders of rose-coloured granite were observed mixed with the volcanic ashes, pumice, and other erupted materials. As the cones preserve their form, glacial action could hardly have brought them here without crushing the walls which remain perfect; the most likely supposition seems to be that they were ejected from the craters, having been torn from the underlying granite through which the eruptive matter has forced its way, as is seen throughout the Sierras.

THE SAGAS IN THEIR RELATION TO ENGLISH HISTORY.

ABSTRACT OF MR. D. SLATER'S PAPER.

(Read February 4th, 1875.)

"A MAGNIFICENT race of men were those war sons of the old North," observes Bulwer Lytton, "whom our popular histories, so superficial in their accounts of this age, include in the common name of Danes." The descents of these Scandinavians on the shores of the British Islands, and other countries of Western Europe, have always been considered among the most remarkable events of modern history. They embarked, under chiefs of royal or noble blood, in ships whose sails spread terror wherever they were seen. Wherever they came and saw, they conquered; or if defeated, it was only to return in greater numbers. Ruric established the Republic of Novgorod, the commencement of the Russian Empire. About the same time they obtained, by the treaty of Wedmore, the cession of a large part of England; and about a generation later, Hrolf (Rollo or Rou) laid the foundation of the renowned Dukedom of Normandy. Entering the Mediterranean, they took many a valuable prize, conquered kingdoms, or visited the Holy Land; while many, entering the service of the Greek Emperors, became the support of the Eastern Empire under the name of the Væringjar. Nor did they confine their voyages to the old world. Their literature records expeditions to the south and west of Iceland, which clearly prove that they visited both Greenland and North America centuries before the birth of Columbus.

These pirates, or Víkingar, as they called themselves, seem to have issued forth from Norway, Sweden, and Denmark, and are sometimes called Northmen, but more frequently by the English historians Danes. I believe that the earliest invaders of this country were principally Northmen; *i.e.* Norwegians. The Anglo-Saxon Chronicle, our chief authority for their first arrival, calls

them "Northmen out of Hæretha-land," which has been identified with a district on the west coast of Norway. The fact is that Dane was used as synonymous with Scandinavian at this period, the Danish kingdom including a large district in the south of Sweden, and the earliest Icelandic writers calling their tongue Dönsk. The way in which the appellation Danes ousted that of Northmen may be seen by comparing the two following accounts of the first arrival of the invaders:

"A. 787. This year King Berhtric took to wife Eadburga, King Offa's daughter; and in his days first came three ships of Northmen out of Hæretha-land."

So reads the Chronicle. Turn now to Henry of Huntingdon.

"A.D. 787. In the fourth year of his reign Bertric took to wife Eadburga, daughter of Offa, king of Mercia. . . . In those days the Danes landed in Britain, from three ships, to plunder the country."

The Scandinavians possess a valuable literature. To disregard it therefore, in the study of that portion of English history which it illustrates, which may be roughly set down as from the 9th century to the 12th, would be very much like sitting down to write a history of the Norman conquest without consulting Norman authorities. Of that literature the following classification has been made: (1) Poetry, (2) Laws, (3) Sagas.

A Saga (English saw) is a prose narrative or legend repeated by word of mouth; but as the Greek λόγος, which originally signified the spoken word, came to be used by Herodotus for the written narrative, whether legendary or historical, so the word Saga came to be applied also to the written story. There are Sagas of all degrees of truth. First we have the mythical, in which the deeds of heroes, half gods and half men, are recorded. Of some such Saga Mr. Thorpe thinks the A.S. poem, "Beowulf," to be a metrical paraphrase, and he cherishes the hope that the original may one day be discovered in some Swedish library. Next we have those relating to Iceland, either national, as the Landnáma, the Icelandic Domesday Book; or relating to individuals, as the celebrated Njal's Saga. Others relate to foreign countries, as the series of Sagas of kings of Norway, of the great line of Orkney Jarls (the Orkneyinga Saga), and of the chiefs who ruled in Faroe (the Færeyinga Saga). For many years traditions were handed down by the mouths of the Saga tellers; but shortly after the introduction of Christianity into Iceland (A.D. 1000), they were reduced to writing. Sœmund

the Learned, who died in 1133, collected the poetical literature embodied in the Elder Edda; and others did for prose what he had done for verse, especially Ari the Learned (d. 1148); so that, as is stated in Sturlúnga, all the Sagas had passed from the oral to the written shape before the death of Bishop Brandr (1201). The Northmen were the first nation in Europe to possess a literature embracing history and prose fiction in their own vernacular tongue.

The Sagas are of much assistance to the student of English history. For the way in which they may be applied to give dramatic force and beauty to the narrative, reference may be made to the description they give of the Battle of Stamford Bridge, the materials of which have been well worked in by Mr. Freeman in his "Old English History," and by Bulwer Lytton in his account of the same battle in his "Harold," book xi.

A few months ago the King of Denmark celebrated the thousandth anniversary of the settlement of Iceland under Ingolf and Leif. The same cause which drove these sons of freedom to Ultima Thule was also the chief reason which sent them to Britain—the tyranny of Harold Hárfagr, or Fairfax as we should call him. His son Hákon was the foster-son of our Athelstan. Mr. Freeman suggests that this is not Æthelstan the Anglo-Saxon king, but the Danish king Guthorm, who received from Alfred the baptismal name of Athelstan.* This seems impossible, as Hákon left England for Norway in 933, and Guthorm-Æthelstan died in 890. For an illustration of the swearing on the holy ring to which this Guthorm was compelled to submit, the lecturer referred to Viga Glum's Saga. The Húskarls, or body-guard of Cnut, became the germ of our standing army; they were the bravest defenders of the ground on the fatal day of Senlac. In fact, after their settlement in England, the Danes became its staunchest defenders against new invaders; and the followers of Swegen confessed that Ulfcytel was the most difficult warrior they had ever had to contend against. Henry of Huntingdon relates of Siward, the brave Earl of Northumberland, that when he heard that his son had died of a wound in the front of his body, he replied, "Then I greatly rejoice." He certainly was one of the bravest defenders of England against foreign invaders, whether his expedition against Macbeth be apocryphal or not. In illustration of the story of Cnut's killing a soldier in a fit of anger, reference was made to his having murdered Earl Ulf,

* "Old English History," p. 159.

brother-in-law of Earl Godwin, because the earl had taken his knight in a game of chess.

One of the Sagas gives us an animated description of a crusading expedition undertaken by King Sigurd of Norway, and another of Rögnvald's, Earl of Orkney. As we read how the latter enters the Mediterranean, descries a huge Dromund in the distance, and determines to attack her, saying that if they pushed close up to her their missiles would fall beyond; how they disregarded the blazing brimstone and burning pitch, most of which fell outside them; and how at last they hacked at her sides and made her their prize, we can almost fancy we have descended half a millennium down the stream of time, and are reading the exploits of a Drake or a Hawkins sailing Westward Ho! to attack a galleon in the Spanish Main.

The Danish spirit still survives in our language, literature, and political institutions, though they soon lost, as a people, their independent existence; for the Dane, unlike the Celt, easily amalgamates with other people. To them we owe the title earl, which was introduced by Cnut, and after the Norman Conquest, according to Selden, altogether superseded the ancient title of alderman. Hustings was a word originally applied to the chief municipal court of London where many of them were settled under the name of lithsmen. Dr. Dasent, Mr. Vigfusson, and, I believe, Dr. Maurer, attribute also to Danish influence our highly-valued institution of trial by jury. The following words in our current English are probably of Scandinavian origin: fellow, foster, gain, hap, heel, ill (evil is Saxon), call—which has superseded clepan, though poets still love yclept—cast, law, wrong, ransack, scamp, take (the Saxon niman still survives in nimble and benumbed), till, fro (from is Saxon), tidings, true-lover, &c.* To these may be added many geographical expressions, seafaring terms, names of persons—those, for example, ending in 'son'—and provincial words still found in the North of England. For example: big (barley), duck (cloth), eilding (fuel), flit (to remove), garth (an enclosure), gaumless (silly), gowk (cuckoo), host (cough), kitling (kitten), lake (play), ling (heather), nieve (fist), rig (back), royd (cleared space), scatt (an old Danish tax still paid in Shetland), skuggy (gloomy), speer

* Since writing the above I have come across a list of words of Scandinavian origin, by Herbert Coleridge, Esq. ("Phil. Soc. Tr., 1859"); but this list contains very few of the words given above.

(to ask), &c. The following French words are also due to the Northmen: bigot, canif, équiper, écraser, étoffe, gauche, gant, jaser, cracher, rincer, cingler (to sail), guichet, &c. It is the opinion of some that to the Danes may be traced the minstrelsy of our borders and the Scottish Lowlands.

There are now in the press the first two volumes of a work by Dr. Dasent, entitled, "A Collection of Sagas and other Historical Documents relating to the Settlements and Descents of the Northmen on the British Isles." The third volume will be under the joint editorship of Dr. Dasent and Mr. Vigfusson. These volumes will very probably bring to light many treasures of historic information which have hitherto lain buried in the rich storehouse of Scandinavian literature.

AN EVENING WITH NEWSPAPERS.

ABSTRACT OF MR. REYNOLDS FOX'S PAPER.

(Read February 11th, 1875.)

The contrast between the first and last quarter of this century is in nowise so much illustrated as by the Newspaper Press of the two periods. Take, for instance, a *Times* of to-day and a *Times* of sixty or seventy years ago—the one with its two large double sheets, its sixteen pages, its ninety-six columns, its three thousand advertisements; the other, a single folio sheet, with its sixteen columns, and seventy or eighty advertisements. The former, printed by steam at the rate of 11,000 to 12,000 per hour; of the latter, not more than 450 per hour turned out by the hand-presses. Previous to 1622 there was no regular printed newspaper. Even during the Elizabethan era—that time of lofty intellect and deeds of high bravery—the nearest approach to a newspaper was the printed bulletins of news which Lord Burleigh despatched to different parts of the country respecting the preparations for and incidents connected with the Spanish Armada. Rome, however, had her written news journals, called *Acta diurna*, containing little gossiping pieces of intelligence, such as, *mutatis mutandis*, are common nowadays. Julius Cæsar was a friend to public journalism. Not so Augustus Cæsar, or most of his successors. There are no traces of newspapers in the history of Greece. In the sixteenth century, at Venice, there was published and sold for a gazetta a news journal bearing the name of the coin paid for it—written, but not printed.

The first printed newspaper in England was published in 1622, by Nathaniel Butter, and entitled, *Weekly News from Italy, Germany*, &c. The first newspapers appear to have been very tame and shorn in their character, not possessing the interest and liveliness of detail which would characterise the more personal chatty news letters. The first trade advertisement in an English paper

appeared in the time of Cromwell. It is as follows: "Monodia Gratiolari—a heroic poem, being a congratulatory panegyric for my Lord General's late return, summing up his successes in an exquisite manner. To be sold by John Holden, in the New Exchange, London. Printed by Thomas Newcourt. 1652." The return spoken of was, no doubt, from the Irish expedition.

Newspapers did not at first contain any reference to proceedings in Parliament or public meetings, so it is not probable that they affected in any degree the great constitutional struggles of those days. Cromwell was very lenient in his treatment of the Press; but Charles II. adopted repressive measures, establishing a censorship of the press, and placing it in the hands of Roger L'Estrange, who advocated the most extreme severity towards unlicensed publications. Charles II. had been in a bad school in his exile. Louis XIV. was a sworn enemy of the journalistic Press. He never forgave the part taken by the newspapers in the civil war of the "Fronde," when the Parliamentary party of Paris, aided by certain great magnates, and backed by the popular Press, succeeded for the time in driving the Court from the capital. When he assumed the reins of Government he imposed the most rigorous restraints on all but the licensed papers. But whilst the French Press was gagged, the Dutch continued to pour into France their numberless little journals by all manner of means—in Rhenish wine bottles, in boots, in coat linings, and even in the muzzle of cannons returning from the wars. Louis, although bitterly hostile to political journals, was indulgent to those which dealt exclusively with literary matters; and for a period the *Journal des Savants* flourished, until a sharp criticism on the action of the Inquisitors with reference to the works of two Frenchmen of liberal views brought down on the head of M. Sallo, the editor, the wrath of the Papal Nuncio, who, however, with great difficulty, induced Louis to dismiss Sallo from the editorship of the paper. The accession of William of Orange to the throne of England was the signal for greater liberality to the Press, which accordingly had the effect of largely increasing the number of the newspapers.

Anne's reign is noticeable, on the one hand, for the talent which began to be attracted to the service of the journals, as illustrated by the names of Swift, Bolingbroke, and De Foe; and, on the other hand, for the inauguration of those oppressive fiscal measures which were aimed by the authorities at the existence of

the papers. A tax was imposed of a halfpenny on papers of half a sheet, and one penny on those of a sheet and upwards. This tax was by successive additions increased, until, in 1815, it had reached the oppressive sum of fourpence.

The Georgian period was remarkable for the rigorous measures adopted towards the Press. Two famous trials occurred in the reign of George II.—that in which Wilkes was concerned, and which indirectly established the practice of reporting the proceedings and speeches of the Houses of Parliament; and the other, that in which Leigh Hunt and his brother were prosecuted for an alleged slandering of the Prince Regent. The Hunts were heavily fined and imprisoned, but they were given to understand that, upon their promising to hold their counsel about the Prince in the future, the fines would be remitted. These terms were distinctly declined, and it is generally considered that this trial and its results contributed much to the establishment of the right of free discussion. The *Times* was founded, under the title of the *Daily Universal Register*, in 1785. The present title was assumed three years subsequently. Its career is the history of the Newspaper Press for nearly three-quarters of a century. The property mainly, for three generations, of one family—the Walters—it has weathered Government prosecutions, and persecutions, and mechanical difficulties; and, by dint of immense energy and the expenditure of great resources, it has become a most potent organ of public opinion, and at the same time a most magnificent property. The *Daily News* has had much of journalistic romance in its history. Edited at one time by Charles Dickens, with very distinguished writers from time to time on its staff, it nevertheless at one period within two years caused its conductors a loss of, it is said, £200,000. It has now however, especially since the reduction of its price to one penny, and owing to the excellent foreign intelligence it supplied during the Franco-German war, taken a new lease of life, and its circulation is supposed to be upwards of 70,000. The *Daily Telegraph* has the largest circulation in the world, whilst the *Standard* has, perhaps, the next, and is certainly larger in size than any of its contemporaries; it was started nearly fifty years ago to advocate the views of those who were opposed to Catholic Emancipation.

The interior establishment of a first-class London or provincial journal presents a wondrously-linked chain of brain, hands, and

machinery. First, the chief editor, controlling the general tone of the paper, perusing and adapting the original matter to be inserted, carrying on a large correspondence, and holding himself responsible for all errors occurring in the paper, whether of omission or commission. He does not, as a general rule, write the leading articles, except on important occasions. Then there is the sub-editor—one, two, or more, as the case may be—whose duty it is to select suitable extracts from other papers, and to prune into shape the communications of penny-a-liners with respect to accidents, fires, murders, and so forth. Then there are the foreign editor, the musical and theatrical editor, and the reader who corrects the proof. Lastly, the compositors and pressmen. Outside this establishment are the reporters; that class of newspaper contributors called penny-a-liners; and the correspondents, whether "our own" "special," or otherwise. Telegraphy is a most important newspaper agency. Reuter's telegrams are in very general use. The secret of his success lies in a thoroughly organised system of offices and staffs of clerks in all the leading cities of Europe. His agents gather the most recent intelligence from various sources, which is telegraphed to the leading papers at fixed rates. The tendency of the times is to make the Provincial Press more local; at the same time, their telegraphic facilities enable them to supply their readers with general news as early as the London papers, and they have a real work to do in advocating and maintaining all that is good and worthy of preservation in our municipal and local institutions. The Press generally exercises a powerful influence for good. One could wish that there were sometimes less political and sectarian partisanship; and one would fain trust that the flippant style of editorial, which treats religious topics of the gravest importance as if it were dealing with a game of battledoor and shuttlecock, will in time give place to good taste and good feeling. Still, regarding the fourth estate in a broad light of view, there is no doubt that it has had a sustaining and cementing influence on the other estates of this realm, and that it has been one of the chief agents in forwarding the universal and sacred cause of human freedom.

THE FLINT AND CHERT IMPLEMENTS FOUND IN KENT'S CAVERN, TORQUAY.

BY W. PENGELLY, F.R.S., F.G.S., ETC.

(Read February 18th, 1875.)

In the churchyard at Torre, Torquay, there is near the belfry door a gravestone bearing the following inscription:—

"Sacred
To the Memory of
The Rev^d. John Mac Enery.
He was born at Limerick,
27^th November, 1797.
For nearly nineteen years he was attached
to the Cary *Family,*
And died at Tor *Abbey*
18^th February, 1841.
He had a heart formed for Friendship,
And, whilst as a Clergyman
He conciliated all Classes by his amiable manners,
He inspired respect as a Scholar
By the vigor of his understanding,
His polished taste, and varied learning.
R. I. P."

Mr. Mac Enery, who was the Roman Catholic chaplain at Tor Abbey, is still remembered by some of the residents at Torquay, all of whom concur in fully endorsing the eulogy on the stone standing at the head of his grave. In the minds of palæontologists and anthropologists, however, his name is permanently associated with that of Kent's Hole, the well-known Cavern made famous by him more than by any other man, and which is from one to two miles east of the Abbey in which he lived and died.

It is obvious from his account of his first visit to the Cavern, made with a party led by the late Mr. Northmore of Cleve, near Exeter, in the summer of 1825, that he had at that time neither any knowledge of geology nor any specific purpose in the visit. "The passage," he says, "being too narrow to admit more than one person at a time . . . the company entered in files, each having a light in one hand and a pickaxe in the other, headed by a guide, carrying a lantern before the chief of the band. I made the last of the train, for I could not divest myself of certain undefinable sensations, it being my first visit to a scene of this nature."* Being doubtful whether Mr. Northmore employed the best method to discover such fossils as the Cavern might contain, he separated from the company, and worked quietly by himself in a small recess, where he had the good fortune to disinter teeth and other osseous remains. "They were," he says, "the first fossil teeth I had ever seen, and as I laid my hand on them, relics of extinct races, and witnesses of an order of things which passed away with them, I shrank back involuntarily. Though not insensible to the excitement attending new discoveries, I am not ashamed to own that in the presence of these remains I felt more of awe than joy."†

Soon after this, he appears to have visited the Cavern again, for in another part of his manuscript he says, "In the summer of 1825 Dr. Buckland, accompanied by Mr. Northmore of Cleve, visited the Cave of Kent's Hole in search of bones. I attended them. Nothing remarkable was discovered that day excepting the tooth of a Rhinoceros and a flint blade. This was the first instance of the occurrence of British relics being noticed in this or I believe any other cave. Both these relics 'twas my good fortune to find."‡

At the close of 1825 he commenced what he intended to be "a thorough examination both of the main branches of the Cavern and of its most intricate involutions and secret recesses," and continued it with but little interruption for some considerable time. There is nothing to show when his researches terminated, but the last of his visits to the Cavern to which he affixed a date—a thing by no means usual with him—was that made on the 14th August, 1829.§ It may therefore be safely concluded that he devoted the greater portion of, at least, almost four years to the work, and it is by no

* "Trans. Devon. Assoc.," vol. iii. (1869), p. 208.
† Ibid, p. 210. ‡ Ibid, p. 441. § Ibid, p. 295.

means improbable that he continued to labour long after the date just mentioned. His investigations, however, had certainly ceased altogether some time before July, 1834, when I first visited the Cavern. Though his researches do not appear to have been conducted with that rigid observance of method which is now thought to be necessary, there is no longer any doubt of their very great value to science. That he failed to complete the thorough examination which he proposed to himself is strikingly seen in the facts that the investigations in the Cavern carried on, without interruption, by the British Association, from 28th March, 1865, to the present time, have been almost invariably in virgin ground; and that should the work be continued, several years must elapse before it can be exhausted.

The flint implement discovered, as already stated, in the summer of 1825, was the forerunner of many others which presented themselves during the progress of his work. Mr. Mac Enery, however, was for some time not quite satisfied that they necessarily belonged to a period earlier than that represented by the sheet of stalagmite which sealed the deposit of Cave-earth containing the remains of the extinct Cave mammals; and, to solve this important problem, he commenced a series of careful observations which ultimately led him to the conclusion that there was "no longer a question of their actual presence under the stratified unbroken floor of stalagmite."* His description of this portion of his labours is so graphic and characteristic as to render it unnecessary to offer any apology for quoting it:—

"Having," he says, "cleared away on all sides the loose mould and all suspicious appearances, I dug under the regular crust [of stalagmite], and flints presented themselves to my hand. This electrified me. I called the attention of my fellow-labourer (Master Aliffe), and in his presence extracted from the red marl [or Cave-earth] arrow and lance heads. I instantly proceeded to the excavation inside, which was only a few feet distant in the same continuous line and formed part of the same plate [or layer]. The crust [of stalagmite] was about two feet thick, steady; the clay [or Cave-earth] rather a light red. About three inches below the crust the tooth of an ox met my eye (I called the people to witness the fact), which I extracted before M. Aliffe; and not knowing the chance of finding flints, I then proceeded to dig under

* "Trans. Devon. Assoc.," vol. iii. (1869), p. 329.

it, and at about a foot I dug out a flint arrow head. This confirmation, I confess it, startled me. I dug again, and, behold! a second of the same size and colour (black). I struck my hammer into the earth a third time, and a third arrow head (but white) answered to the blow. This was evidence beyond all question."

. . . . . .

"Dr. Buckland is inclined to attribute these flints to a more modern date, by supposing that the ancient Britons had scooped out ovens in the stalagmite, and that through them the knives got admission to the diluvium [or Cave-earth], and that in this confused state the several materials were agglutinated together. . . . Without stopping to dwell on the difficulty of ripping up a solid floor, which, notwithstanding the advantage of undermining and the exposure of its edges, still defies all our efforts, though commanding the apparatus of the quarry, I am bold to say that in no instance have I discovered evidence of breaches or ovens in the floor, but one continuous plate of stalagmite diffused uniformly over the loam.

. . . . . .

"It is painful to dissent from so high an authority, and more particularly so from concurrence generally in his views of the phenomena of these caves, which three years' personal observation has in almost every instance enabled me to verify." *

It is not intended to follow Mr. Mac Enery's cavern researches any further on this occasion, but I cannot forego the pleasure of stating that the Baroness Burdett-Coutts, who has done so much to promote the increase as well as the diffusion of science, has recently taken the requisite steps for making the following addition to the inscription on his headstone, which has been already quoted:—

"Mr. Mac Enery was the pioneer of systematic observations in Kent's Hole and other Caverns in this neighbourhood; the sagacious and reverent observer of the works in nature of Him whose is the earth and the fulness thereof."

Without dwelling on the subsequent and confirmatory researches carried on in Kent's Hole by Mr. Godwin-Austen, and still later by the Torquay Natural History Society, I purpose devoting this paper to a description and consideration of the Flint and Chert Implements found in the Cavern by the Committee appointed by the British Association; and to call attention to the fact that, whilst all the noteworthy specimens are unpolished and found with the

* "Trans. Devon. Assoc.," vol. iii. (1869), pp. 329, 334, and 338.

remains of extinct animals, they belong to two distinct classes, eras, and stages of civilization.

Though there are said to be persons capable of believing that the so-called stone implements found in caverns and river-gravels are merely natural products, it is not my intention to say one word on the question. It has been treated so fully and so ably by various writers as to deprive me of any pretence for attempting to add anything to the literature of the subject, and also of all hope that any additions which I might be able to make would have the least effect on those still remaining in a sceptical state. Life is too short to justify one in spending much of it in frequently proving the truth of the Multiplication table.

It may be of service at the outset to give a brief description of the situation and character of Kent's Hole, the deposits it contains, and the objects of interest which have been found in it.

The Cavern occupies a small wooded hill, exclusively of Devonian limestone, about a mile east of Torquay harbour, half a mile north of Torbay, and a quarter of a mile west-south-west of Ansty's Cove. Its summit is rather more than 200 feet above mean-tide level, and immediately north of it is another hill of similar height and composition, from which it is separated by a small valley. They are surrounded on all sides and at no great distance by hills attaining to a greater height, and differing from them geologically, as is shown below.

NAMES.	SUMMIT.			COMPOSITION OF HILL.
	Direction of	Distance of	Height of	
Hope's Nose Hill	S.E.	·57 mile	353 ft.	Devonian Shales and Grits.
Lincombe Hill ..	S.W.	·41 „	404 „	„ „ „
Warberry Hill ..	N.W.	·50 „	450 „	„ „ „
Stoodley Knowle	N.N.E.	·22 „	267 „	Limestone, Shale, and Trap.
Black Head	E.	·43 „	305 „	Trap.

Kent's Hole hill terminates in a small vertical cliff on the eastern side, in which are two apertures leading into the Cavern. They are nearly on the same level, 54 feet apart, about 190 feet above the

level of mean tide, and from 60 to 70 feet above the bottom of the valley in the same vertical plane.

Nothing is known about the discovery of the Cavern, or the origin of its name; but it seems to have been well known early in the eighteenth century, for according to a map of the property in which it is situate, executed in 1769, and belonging to Messrs. Kitson of Torquay, a portion of the Manor of Torwood was termed Kent's Hole Field. In 1778 the following mention of it was made in the eighth edition of "A Tour through the Island of Great Britain," to which my attention has been recently directed by Sir W. C. Trevelyan, Bart., F.G.S., one of the earliest workers in the Cavern:—"In the parish of Tor, is a very remarkable place, called *Kent's Hole*, not mentioned, as I can find, by the writers on this county [Devonshire], though perhaps the greatest natural curiosity therein."* The work just quoted was originally begun by the celebrated Daniel de Foe, and was first published in 1714. I have recently consulted the 1st, 2nd, and 7th editions—the latter published in 1769, and edited by Richardson the novelist—but neither of them contains any mention of Kent's Hole. Judging from the articles found in the loose mould which formed the uppermost of the deposits it was at least occasionally visited throughout the entire period from pre-Roman times to the present day.

The Cavern consists of two parallel "Divisions"—an eastern and a western—each containing a series of Chambers and Passages, and throwing off lateral branches, some of which are of considerable length and very tortuous. The Divisions are united near their northern and at their southern ends. The connecting passage at the latter extremity is completely filled with various deposits, whilst the northern appears to have always been a comparatively lofty open Chamber. The Eastern Division, into which the two apertures or entrances directly open, and which has been completely explored by the Committee, is 285 feet long, 90 in greatest breadth, and, when measured from the bottom of the excavation made by the explorers, 22 feet in maximum height. The Western Division is probably of greater length, but its exploration is by no means completed. Throughout the greater part of its extent it is at a considerably lower level than the Eastern.

* *Op. cit.*, vol. i. p. 347.

The successive deposits were, in descending order:—

1st, or uppermost. Fragment and blocks of limestone from an ounce to upwards of 100 tons weight each, which had fallen from the roof from time to time, and were in some instances cemented together with carbonate of lime.

2nd. Beneath and between the blocks just mentioned lay a dark-coloured mud or mould, consisting largely of decayed leaves and other vegetable matter. It was from three to twelve inches thick, and known as the *Black Mould*. This occupied the entire extent of the Eastern Division (with the exception of a small Chamber at its south-western end only) and the Chamber connecting it with the Western Division, but it was not found in any other part of the Cavern. In other words, it was found in all the parts comparatively near to the external entrances, but not in those remote from them.

3rd. Under this was a Stalagmitic floor, commonly of granular texture and frequently laminated, varying from less than an inch to upwards of five feet in thickness, frequently containing large blocks of limestone, and from its prevalent structure termed the *Granular Stalagmite*.

4th. An almost black layer, about four inches thick, composed mainly of small fragments of charred wood, and distinguished as the *Black Band*, occupied an area of about 100 square feet, immediately under the Granular Stalagmite throughout about half its area, but covered with a thin layer of Cave-earth elsewhere; and, where nearest to it, was about 32 feet from one of the entrances to the Cavern. Nothing resembling it has up to the present time been found elsewhere.

5th. Immediately under the Granular Stalagmite and the Black Band lay an accumulation of light-red clay, containing on the average about 50 per cent. of small angular fragments of limestone, and somewhat numerous blocks of the same rock as large as those already mentioned as lying on the Black Mould. In this deposit, known as the *Cave-earth*, many of the stones and osseous remains were, at all depths, invested with thin stalagmitic films; and it occasionally contained in a few localities large isolated masses of stalagmite having a very crystalline texture, sub-angular and rounded fragments of quartz and dark-red grit sometimes cemented into more or less round detached lumps of firm concrete, and a very few granitoid pebbles. The Cave-earth was usually of unknown depth,

certainly, and perhaps greatly, exceeding four feet; but it was occasionally much less, and in some instances there was none. In short, its depth was greatest, and its upper surface attained the highest level, at the external entrances, whence it sloped downwards and became less deep in every direction. It "thinned out" before reaching the southern end of the Eastern Division—though small "pockets" of it were met with further south—and its thickness was very limited in the Western Division, especially in its southern portions. In all cases, however, it extended beyond the foot of the declivity which its upper surface formed.

6th. Wherever the bottom of the Cave-earth was reached, there was found beneath it a floor of Stalagmite having a crystalline texture, identical with that of the isolated masses incorporated in the Cave-earth as already mentioned. This, designated the *Crystalline Stalagmite*, was usually of greater thickness than the upper or Granular floor vertically above it, and in some instances but little short of 12 feet. Where there was no Cave-earth, the Granular Stalagmite lay immediately on the Crystalline.

7th. Below the whole, occurred, so far as is at present known, the lowest and oldest of the deposits which the Cavern contained. It was composed of sub-angular and rounded pieces of dark-red grit, with a comparatively small number of quartz pebbles, embedded in a sandy paste of the same colour. Small angular fragments of limestone, and thin investing films of stalagmite, both prevalent in the Cave-earth as already stated, were extremely rare; large blocks of limestone were occasionally met with, and the deposit, to which the name of *Breccia* was given, was of a depth exceeding that to which the exploration has yet been carried.

The masses of Crystalline Stalagmite and the fragments and lumps of dark-red grit found embedded in the Cave-earth were undoubtedly portions, not *in situ*, of the older deposit—the Crystalline Stalagmite floor and the Breccia, Nos. 6 and 7, just described,—and show that these accumulations had been partially broken up by some natural agency before and during the introduction of the Cave-earth, and that they were formerly of greater volume than at present. In all cases the Breccia attained a higher and higher level with increased distance from the known external entrances to the Cavern; thus suggesting that it was introduced through undiscovered openings in what is now termed the "inner extremity" of the Cavern. In short, the Cave-earth and Breccia

form two inclined planes dipping towards one another; the Cave-earth at a high gradient, and the Breccia at a low one.

Excepting the overlying blocks of limestone, (No. 1,) which need not be mentioned again, all the deposits contained remains of animals. In the Black Mould, the most modern accumulation, they were those of species still existing, and almost all of them now occuping the district; namely, Man, Dog, Fox, Badger, Brown bear, *Bos longifrons*, Roe-deer, Sheep, Goat, Pig, Hare, Rabbit, Water-rat, and Seal.

The Cave-earth may be termed the great mausoleum of the Cavern, in which recent and extinct species were commingled. As the remains found in the Black Band, which may be said to form part of it, and in the overlying Granular Stalagmite, belonged to species all represented in the Cave-earth but not in the overlying Black Mould, the three deposits may be regarded as belonging to one and the same biological era. The following is a list of the species they have yielded:—The Cave hyæna was by far the most prevalent form, and his presence was attested, not only by his numerous teeth and bones, but by his coprolites, by bones broken in a manner still followed by existing members of the same genus, and by the marks of his teeth on a very large portion of the osseous remains, including those of his own kith and kin. The next most prevalent forms were the Horse and Rhinoceros. Remains of the Gigantic Irish Deer, Wild Bull, Bison, Red Deer, Mammoth, Badger, Cave Bear, Grizzly Bear, and Brown Bear were by no means rare; those of the Cave Lion, Wolf, Fox, and Reindeer were less numerous; and those of Beaver, Glutton, *Machairodus latidens*, and Man were very scarce. So far as is at present known, the presence of the Glutton is attested by a single os innominatum; *Machairodus latidens*, by five canines and two incisors; and Man, by a portion of upper jaw containing four teeth, which together with a solitary tooth was found at the base of the Granular Stalagmite, where it was 20 inches thick.

In the lowest deposits—the Crystalline Stalagmite and the Breccia—remains of animals were less uniformly distributed. In some instances there were none throughout considerable volumes of the deposits, whilst in others they formed 50 per cent. of the entire accumulation. For a considerable period relics of bears were alone found, but recently two "finds" of feline teeth, probably *Felis spelæa*,

have been met with. Not only were there no bones of the Hyæna; there were none of his fæces, none of his teeth marks, no bones fractured after his well-known pattern; in short, nothing whatever to indicate his existence.

The bones found in the superficial Black Mould were of much less specific gravity than those found in the accumulations below it, and were generally so light as to float in water. Those in the two sets of deposits represented by the Cave-earth and the Breccia respectively, had lost their animal matter, and adhered to the tongue when applied to it so as frequently to support their own weight; but those from the Breccia and its Crystalline Stalagmite —the lowest known deposits—were distinguished from the remains of the Cave-earth series in being much more mineralized and more brittle, by being of a darker or sometimes of a much whiter colour, and frequently by emitting a metallic sound when struck.

The following general statements may be of service before proceeding further:—

1st. The Cavern contained three distinct mechanical accumulations—the Black Mould, or uppermost, or most modern; the Cave-earth, including the local Black Band; and the Breccia, or lowermost, or most ancient known. Their mode of succession was never transgressed, and the materials of which they consisted were so very dissimilar as to characterize them with great distinctness.

2nd. These three accumulations were separated by two distinct Stalagmitic Floors having strongly contrasted characters. That dividing the Black Mould, or uppermost deposit, from the Cave-earth was Granular; whilst that lying between the Cave-earth and the Breccia, or lowermost deposit yet found, was eminently Crystalline.

3rd. Animal remains occurred everywhere, but more abundantly in the mechanical beds than in the Stalagmites.

4th. The period represented by the Black Mould—the most modern period—may, as a matter of convenience, and so far as the Cavern is concerned, be termed the *Ovine period;* remains of Sheep being restricted to this accumulation.

5th. The period of the Granular Stalagmite, Black Band, and Cave-earth, taken together, may be denominated the *Hyænine period*, the remains and indications of Hyæna being confined to these deposits, and far more prevalent than those of any other species.

6th. The period of the Crystalline Stalagmite and the Breccia—the most ancient period represented by the Cavern deposits so far as they are at present known—may be called the *Ursine period;* these deposits having yielded a great number of remains of Bear, but, with the exception of a very few feline teeth, none of any other species.

Flint and chert implements presented themselves in each of the mechanically-formed deposits, and, as in the case of the osseous relics, those belonging to any one of them were easily distinguishable from such as occurred in the other two.

The implements of the Black Mould—the Ovine, or most modern period—were of the ordinary colour of common flints. They were mere flakes and "strike-lights," the latter probably used and cast aside or lost by those who, during a long period, and before the invention of lucifer-matches, acted as guides to the Cavern. All further mention of them may be omitted, as not being noteworthy. In the same deposit were found many other human industrial remains, amongst which were spindle-whorls made of different kinds of stone, some ornamented and others plain; fragments of curvilineal plates of slate—perhaps covers of earthenware vessels; amber beads; bone tools, including awls, chisels, and combs, the last being of the form and size of shoe-lifters, and having the teeth at the broad end; bronze articles, including rings, a fibula, a spoon, a spear-head, a socketed celt, and a pin; portions of cakes of smelted copper; and a great number and variety of potsherds, including fragments of Samian ware.

Omitting flakes and mere chips, of which there were great numbers, the principal flint and chert implements found in the Cave-earth—the Hyænine period—were *ovoid* and *lanceolate*, produced by fashioning, not flint or chert nodules, but flakes purposely struck off them. They were of comparatively delicate proportions, and usually characterized by bilateral symmetry. Those of flint were commonly of a white colour and porcellaneous aspect, and, through metamorphosis, capable of being scratched with a knife and possessing a granular chalk-like texture. The Cave-earth and Black Band have also yielded several interesting bone implements, all met with in that part of the Cavern termed "The Vestibule" by Mr. Mac Enery, into which the northern entrance immediately opens. Neither the stone nor the bone tools were restricted to any

particular level; and some of each series were found at the greatest depth to which excavations have been carried in the Cave-earth.

Mr. John Evans, a member of the Committee now engaged in the exploration of Kent's Hole, who, in his great work on Ancient Stone Implements, has figured many of the Human industrial remains found in the Cave-earth,* has kindly allowed his blocks to be used in illustrating this paper. It has not been deemed necessary to make use of more than nine of these figures, which will suffice to give an idea of the typical specimens. The accompanying descriptions have been compiled from the Cavern Journal, the British Association Reports, and Mr. Evans's work, just mentioned.

Fig. 1 (No. 1163† in the Cavern Journal, and Fig. 386 in Mr. Evans's work,) represents, on the scale of one half, linear, an ovoid disc of grey cherty flint, carefully chipped on both faces, one of which is rather more convex than the other. It is wrought to a slightly undulating edge all round the perimeter, except at one spot on the side where blows seem to have been given in vain in attempting to remove a flake, and its bilateral symmetry is sensibly perfect. The traces upon the edge of wear or use are but slight. It was found in the "Great Chamber," 53 feet from the southern entrance to the Cavern, in the fourth foot-level of Cave-earth—the lowest to which it has been excavated—over

Fig. 1. ½

* See "The Ancient Stone Implements, Weapons, and Ornaments, of Great Britain." By John Evans, F.R.S., F.S.A., &c. 1872, pp. 444-466, figs. 386-408.

† The numbers quoted from the "Journal" are those, not of the specimens, but of the "finds" to which the specimens belong.

which was the continuous Floor of Stalagmite about a foot thick; and was dug out in the presence of the Rev. W. Harpley, Mr. W. N. Row, and myself.

Fig. 2 (No. 1515, Cav. Journ., and Fig. 389, Evans,) is that of a specimen, on the scale of one half, linear, which may be said to connect the ovoid and lanceolate implements; differing from the former in being pointed at one end and square at the other, but resembling them in being broadest not far from the middle. Its dimensions are considerably below those of the ordinary ovoid tools, whilst its breadth in proportion to its length is greater than in typical lanceolate specimens. It is of fine-grained cream-colour flint, and the patina covering its entire surface is more pronounced than in any other of the Cavern implements. Its faces are equally convex, and are chipped over their whole surface. Its bilateral symmetry is almost perfect, and from its shape it seems adapted to have formed the point of a lance, but the lateral and basal edges are in many parts worn away as if it had been used as a sort of scraping tool, and it has lost its extreme point. It was found in "The Gallery," 83 feet from the nearest external entrance, in the second foot-level of Cave-earth, beneath a thick and continuous Floor of Stalagmite, May 8th, 1866.

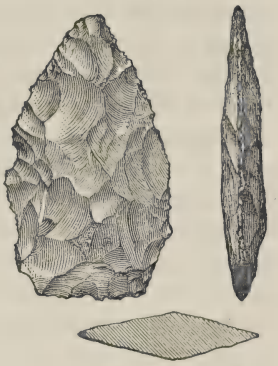


Fig. 2. ½

Fig. 3 (No. 1822, Cav. Journ., and Fig. 397, Evans,) is a full-size representation of a tool, formed from a ridged flake, and exhibiting marks of having been in use as a scraping tool, not only at one end, but also at the sides. It was found, with two other such specimens and a flint chip, in the first

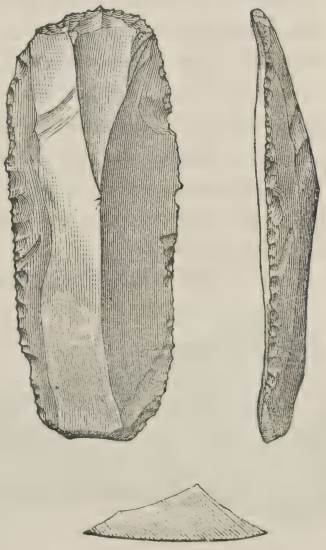


Fig. 3. 1

foot-level of Cave-earth, beneath the continuous Stalagmite Floor 13 inches thick, in "The Vestibule," upwards of 30 feet from the northern entrance, November 17th, 1866.

Fig. 4 (No. 3869, Cav. Journ., and Fig. 391, Evans,) gives views, on the scale of one-half, linear, of a remarkably elegant instrument, made from a ridged or carinated flake, but having three facets at the but-end and a little secondary working on one side. At the but-end the outer face of the flake, not of the nodule, has been left in its original condition; whilst the inner face, as shown in the figure, has had the original surface of the flake almost entirely removed by secondary working, and the edges have again been retouched so as to make them even and sharp. The but-end is chisel-like in form. It is of a sort of piebald flint, being partly of a white and elsewhere of a drab colour; and was found in the second foot-level of Cave-earth, beneath the continuous floor of Stalagmite which was 32 inches thick, in the "South west Chamber," upwards of 130 feet from the nearest external entrance, in my presence, July 4th, 1868. There were a few bones lying with it, and immediately below were 13 molar teeth of horse, a canine tooth of hyæna, and a gnawed bone.

Fig. 4. $\frac{1}{2}$

The specimens artificially wrought in bone are seven in number, of which five only are figured in this paper. The figures are all of full size.

Fig. 5 (No. 1835, Cav. Journ., and Fig. 407, Evans,) is that of

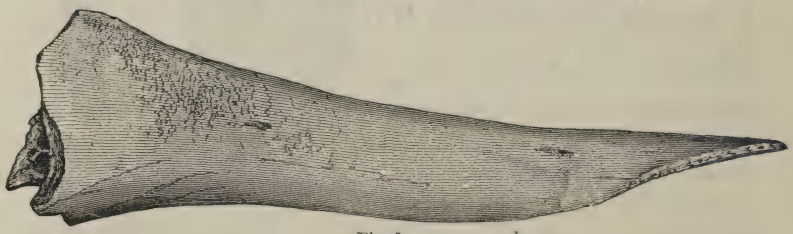


Fig. 5. $\frac{1}{1}$

a bone awl, sharply pointed at one end. It was found, with several bones and five flint chips, in the Black Band, about 40 feet from

the northern entrance, below the continuous and unbroken Floor of Stalagmite 16 inches thick, November 27th, 1866. The marks of the tool with which it was scraped into shape are distinctly visible on it.

Fig. 6 (No. 1847, Cave. Jour., and Fig. 408, Evans,) represents a bone "needle" having a well-drilled circular eye, but unfortunately without its lower or pointed end. It is slightly taper in form and elliptical in transverse section. Its greatest diameter at the larger end is about ·075 inch, and where broken about ·05 inch, so that its original length was probably about 2·55 inches. The eye is capable of receiving thread of about three-eightieths of an inch in diameter, or of the thickness of fine twine. This interesting specimen was found in the Black Band, beneath the Floor of Granular Stalagmite, December 4th, 1866; but at that time, being almost entirely enveloped in stalagmite from which the broken end alone projected, it was supposed to be merely a small bone of no particular interest, and its true character was not discovered for nearly two years. During the interval the "find," of which it was one specimen, had been placed by itself in a box, as in all other cases, and packed away in a room set apart for the Cavern specimens. On 24th September, 1868, whilst I was preparing the osseous contents of a number of boxes for the inspection of Mr. Boyd Dawkins, one of the palæontologists on the Cavern Committee, the investing stalagmite fell off this specimen whilst it was in my hand, and at once disclosed the true character of what had been put aside as nothing more than a small ordinary bone. Though it has received the name of a "needle" it would probably be more correctly termed a "bodkin," as being too slender to force a passage through skins of animals—and there is no reason to suppose that there were any contemporary textile fabrics,—it was probably employed to carry threads through holes made with bone awls, such as that represented in fig. 5.

Fig. 6. ½

"Such needles," says Mr. Evans, "have been found in considerable numbers in the caves of the age of La Madelaine, such as Les Eyzies, Laugerie Basse, Bruniquel, and the lower cave of Massat. . . . . They vary in length from 3¼ inches to 1 inch, and some have been found that show that, after they had been accidentally broken through the eye, a fresh eye was drilled. That this could readily be effected by means of a pointed flint was

proved to demonstration by the late Mons. E. Lartet, who both made bone needles and bored eyes in them by means of flint tools alone." *

Fig. 7 (No. 1929, Cav. Journ., and Fig. 406, Evans,) is that of

Fig. 7. $\frac{1}{1}$

a well-formed bone pin found January 3rd, 1867, in the fourth foot-level of Cave-earth—the greatest depth to which it has been excavated—in immediate contact with an unworn crown of a molar tooth of a rhinoceros. Vertically over them there lay, in ascending order, four feet of Cave-earth; then the Black Band with its profusion of flint tools, and remains of the hyæna and other Cave Mammals; over this the Granular Stalagmitic Floor, 20 inches thick, perfectly intact, and continuous in all directions; this was surmounted by the Black Mould; and the whole was crowned with large blocks of limestone, cemented with carbonate of lime into a firm mass, which reached the roof and almost completely separated the Vestibule from the rest of the Cavern. The pin is well made, has a distinct head, from immediately behind which it tapers off to a sharp point. It is almost perfectly round, and has a considerable polish, the latter being in all probability the result of having been constantly used to fasten the skin dress of its owner.

Fig. 8 (No. 2206, Cav. Journ., and Fig. 404, Evans,) represents a bone "harpoon" found with a flint flake and a bone apparently cut artificially, in the first or uppermost foot-level of Cave-earth,

Fig. 8. $\frac{1}{1}$

beneath the Black Band, which in its turn was covered with the Granular Stalagmitic Floor from 12 to 20 inches thick, and over this again was the Black Mould with its pre-Roman objects. When dug out it was, as at present, in two pieces, one almost, and the other completely, enveloped in stalagmite. Indeed, the latter portion was regarded, and packed away with the entire "find," as a small pipe or stem of stalagmite, and the discovery of its true character was made November 28th, 1868, under circumstances precisely

* "Ancient Stone Implements," p. 461.

similar to those described in the case of the "needle." Though broken, it is very nearly perfect, and is barbed on one edge only.

Another "harpoon" (No. 1970, Cav. Journ., and Fig. 405, Evans,) similarly barbed, was found with 16 flint flakes and a flint core, in the Black Band, January 18, 1867. It is less perfect and has seen more service than No. 2206.

Fig. 9 (No. 2282, Cav. Journ., and Fig. 403, Evans,) is a representation of a third bone "harpoon," which differs from those just mentioned in being barbed on two opposite sides, the barbs being also opposite, not alternate. It was found March 18th, 1867, in the second foot-level of Cave-earth, and over this was the usual succession of deposits found in the Vestibule. Like all bones found in the Cave-earth, the "harpoon" when applied to the tongue, firmly adheres to it; in other words, it has the condition which, from the spot it occupied, might have been expected. The striated marks of the tool with which it was scraped into form are still distinctly visible in places. "Harpoons," both doubly and singly barbed, of precisely the same character, have been found in the Cave of La Madelaine, in the Dordogne, France, where they usually consist of reindeer horn, which was not improbably the case in the Kent's Hole specimens also. Implements of this kind have been found in numerous localities on the Continent.

Fig. 9. $\frac{1}{1}$

There was also found in the second foot-level of Cave-earth, in the Vestibule, February 4th, 1867, a canine tooth of a badger, the fang of which had been reduced to a wedge-like form, and perforated obliquely, as if for the purpose of being strung. The overlying Stalagmitic Floor had been broken by the early explorers, but the Superintendents of the investigation now in progress have no doubt that the soil in which the tooth lay was intact, and that the specimen may be taken as an indication that the Cave-men of the Hyænine period occupied themselves in making ornaments as well as objects of mere utility.

The implements found in the Breccia—the Ursine, or so far as is at present known, the most ancient of the Cavern periods—were exclusively of flint and chert. They were much more rudely formed, more massive, less symmetrical in outline, and made by operating, not on flakes, but directly on nodules, of which portions

of the original surface generally remain, and which were probably derived from supra-cretaceous gravels existing in great volume between Torquay and Newton Abbot, about four miles from the Cavern. It is obvious, however, that even such tools could not be made without the dislodgment of flakes and chips, some of which would be capable of being utilized; and accordingly a few remnants of this kind were met with in the Breccia; but they were all of a very rude, simple character, and do not appear to have been improved by being chipped. The implements were by no means so abundant as those of the Cave-earth; that is to say, a given volume of Breccia did not yield so many implements as on the average occurred in an equal volume of Cave-earth. Whether equal periods of time are represented by equal volumes of deposit in the two cases, or whether equal periods of time represent equal numbers of Cave-dwellers, or tool-makers, or flint tools are questions into which it is not now proposed to enter. Through the assistance of Mr. Spence Bate, who kindly made a drawing of the original, I am enabled to give the accompanying figure of a characteristic specimen of the tools found in the Breccia, of which the following description was given in the Committee's Ninth Annual Report:—

Fig. 10. ½

Fig. 10 (No. 6022, Cav. Journ.) represents, on the scale of one-half, linear, "a fine kite-shaped tool, 5·1 inches long, 2·6 inches in greatest breadth, and 2 inches in greatest thickness. On one side, especially at the but-end, it is very convex; on the other it may be said to have a tendency to flatness; but as this inner face

consists of two principal planes or facets sloping in opposite directions from a transverse ridge about midway in its length, the flatness is not strongly pronounced. At the but-end, on the convex face, it retains much of the original surface of the nodule, and shows that it was made from a well-rolled pebble. The rest of the surface has a somewhat orange-coloured tint, derived, no doubt, from the matrix in which it was found. On one or two small facets near the point, however, this tint does not appear, but the true whitish colour is displayed. . . . Within the substance of the implement, and near the point, there is a small irregular quartz pebble. . . . This specimen was found on Nov. 27th, 1872, at a depth of 16 inches in the undisturbed Breccia, under a block of limestone measuring 24 × 14 × 14 inches, adjacent to the left wall of the 'Arcade,' 73 feet from its entrance, that is about 160 feet from the nearest external entrance of the Cavern. No animal remains or other objects of interest were found near it."*

In proceeding to the chronology of the Cavern, the following facts show that the implements of the Breccia belonged to an earlier period than those of the Cave-earth :

1st. When the two deposits occurred in the same vertical section—and this was invariably the case when flint or chert tools were met with in the Breccia,—the Cave-earth overlay the Breccia in every instance.

2nd. Though thus lodged on the same area, the two deposits were very dissimilar, as has been already stated; the Breccia being essentially a dark-red sandy paste containing a very large number of subangular and rounded fragments of grit of the same colour, which, though derivable from adjacent loftier eminences, the Cavern hill could not supply; whilst the Cave-earth was made up of a light-red clay with small angular fragments of limestone.

3rd. These two deposits were separated by a sheet of Crystalline Stalagmite, in some places almost twelve feet thick, formed after the materials of the Breccia were deposited, but before the introduction of the Cave-earth commenced.

4th. After the Stalagmite just mentioned had sealed up the Breccia, it was, in extensive parts of the Cavern, broken up by some natural agency, and much of the latter, if not of both, was dislodged, and carried out of the Cavern before the first instalment of Cave-earth was deposited.

5th. The Cavern faunæ during the periods represented by the

* See Report Brit. Assoc., 1873, p. 206.

Breccia and Cave-earth respectively, were very dissimilar. That of the older era did not include the Hyæna, which played so conspicuous a part in the Cavern history during the Cave-earth era, and whose agency, next to that of man, made Cavern-searching an important branch of science.

That the deposits, with the constructive and destructive processes just described, were not only distinct and successive, but also very protracted, terms in the Cavern chronology is strikingly seen in considering the changes they indicate.

1st. During the period of the Breccia, there was a machinery capable of transporting from Lincombe or Warberry Hill, or both, or from some greater distance, fragments of dark-red grit, varying in size from pieces four inches in mean diameter to mere sand, and lodging them in the Cavern. This so completely passed away that nothing whatever was carried in, but the deposit already there was covered with a thick sheet of Stalagmite obtained through the solution, by acidulated water, of portions of the limestone in the heart of which the Cavern lay. This stage having also ended, the Stalagmite was broken up by some natural agency, the exact character of which it is difficult to ascertain, but which achieved its work, not by one effort, but by many in succession, and much of at least the Breccia it covered was dislodged and carried out of the Cavern. This re-excavating period having in like manner come to a close, a second deposit was introduced; but, instead of consisting of dark-red sand and stones as in the former instance, it was made up of a light-red clay, and in it were embedded small fragments of limestone, which, from their angularity, could not have been rolled, but were in all probability supplied by the waste of the walls and roof of the Cavern itself.

2nd. The palæontology of the two deposits is perhaps even more significant of physical changes and the consequent absorption of time. When the Cavern-haunting habits of the Hyæna are remembered, it will be seen that his entire absence from the fauna of the Breccia, and his remarkable preponderance in that of the Cave-earth, renders it eminently probable that he was not an occupant of Britain during the earlier period. To accept this, however—and there seems to be no escape from it—is to accept the opinion that between the eras of the Breccia and of the Cave-earth it had become possible for the Hyæna to reach this country, since he was

actually here, and in great force. In other words, the men of the Breccia, the Ursine period of the Cavern, saw this country an island as we see it,—unless, indeed, their era was prior to this insularity—when it was also occupied by Bears and Lions, but not by Hyænas; whilst in the time of their descendants, or their successors, the whole of Western Europe had been so elevated that the channel which previously and subsequently separated it from the continent was dry, and Britain was in a continental condition.

The conclusion which has just been reached will of course be met with the question, "What countenance does geological science give to it?" Are there other, independent, and sufficient reasons for believing that Britain, in what geologists would call very recent times, has been in a continental condition? Before proceeding to this question, however, there is a topic, arising out of what has been already advanced, deserving a passing notice. Though the absence of remains or indications of the Hyæna in the Breccia appears to admit of no other interpretation than that the genus had not then reached this country, the same inference cannot be drawn respecting the Horse, Ox, Deer, &c., whose remains are equally wanting in the same deposit; for it may be presumed that their bones occur in caverns mainly because their dead bodies were dragged thither piecemeal by the Hyæna; and, excepting such bones as may have been washed in by continuous streams or occasional floods, this could not have occurred, even though they had crowded the country, before the arrival of the great bone-eating scavenger who made the Cavern his home. The remains of the Bear in the Breccia present no difficulty, for their introduction did not require the agency of the Hyæna, since the Bear is a Cave-dweller. The presence of the few feline teeth in the Breccia, already mentioned, may be sufficient probably to account for teeth marks should any hereafter be detected on osseous remains in that deposit, for though the felidæ do not eat bones, they very industriously gnaw them. Such marks, however, have not yet been detected.

But to return to the question of the continental condition of Britain in times geologically recent: The scheme of geological chronology employed by Sir C. Lyell is based on Palæontology. In it, all deposits in which the fossil remains of *Mammals*, as well as of *Mollusks*, are those of species identical with such as now live, are termed *Recent*. Those next below, and therefore next older,

in which the shells are *all* of living forms, whilst the Mammalia, in part, and often a considerable part, belong to extinct species, such as the Mammoth and his contemporaries, are called *Pleistocene*. The Recent and Pleistocene together, make up the *Post-Tertiary*, or as some term them, the *Quaternary* deposits. The beds next lower, that is the uppermost or more recent Tertiaries, are denominated the *Newer Pliocene*, and are characterized by the fossil shells containing a small minority of extinct species. It is not necessary to go here into still more ancient times.

The distinguished author just mentioned recognizes *two* distinct periods during the Pleistocene era when, at least, Western Europe stood at a level so much higher than at present that Britain formed a continuous portion of the continent. "In order," he says, "to form a connected view of the most simple series of changes in physical geography which can possibly account for the phenomena of the glacial period, and the period of the establishment of the present provinces of animals and plants, the following geographical states of the British and adjoining areas may be enumerated.

"First, a continental period, towards the close of which the forest of Cromer flourished: when the land was at least 500 feet above its present level, perhaps much higher. . . . . The remains of *Hippopotamus major*, and *Rhinoceros etruscus*, found in the beds of this period, seem to indicate a climate somewhat milder than that now prevailing in Great Britain." [This was a *Pre-glacial* era.]

"Secondly, a period of submergence, by which the land north of the Thames and Bristol Channel, and that of Ireland, was generally reduced to an archipelago. . . . This was the period of great submergence and of floating ice [in British waters], when the Scandinavian flora, which occupied the lower [? higher] grounds [of Britain] during the first continental period, may have obtained exclusive possession of the only lands not covered with perpetual snow." [This was a portion of the *Glacial period*, or perhaps, more correctly, it was one of the Glacial periods.]

Thirdly, a second continental period, when the beds of the glacial sea [just described], with its marine shells and erratic blocks, was laid dry, and when the quantity of land equalled that of the first period. . . . During this period there were glaciers in the higher mountains of Scotland and Wales, and the Welsh glaciers . . . . pushed before them and cleared out the marine drift with which some valleys had been filled during the period of

submergence. . . . During this last period the passage of the Germanic flora into the British area took place, and the Scandinavian plants, together with northern insects, birds, and quadrupeds retreated into the higher grounds. . . .

"Fourthly, the next and last change comprised the breaking up of the land of the British area once more into numerous islands, ending in the present geographical condition of things. There were probably many oscillations of level during this last conversion of continuous land into islands, and such movements in opposite directions would account for the occurrence of marine shells at moderate heights above the level of the sea, notwithstanding a gradual lowering of the land. . . . During this period a gradual amelioration of temperature took place, from the cold of the glacial period [just described] to the climate of historical times."*

In the foregoing quotation, two topics are introduced—the *Forest of Cromer*, and the extent of the submergence during the inter-continental period, to which it may be well to devote a few remarks.

The Forest of Cromer is now represented by a bed at the base of the sea cliffs near Cromer, in Norfolk, consisting of clay enclosing stumps of trees with roots outspread, and reposing on a floor of solid chalk. It was my good fortune to study this ancient submerged forest several years ago in company with the Rev. J. Gunn, F.G.S., who has devoted much time and attention to it, and has made a large and valuable collection of its fossils. The following brief description of it, however, has been mainly compiled from the writings of Sir C. Lyell:

The forest has been known and studied by various geologists during a great number of years, and has been traced from Cromer to Kessingland, a distance of more than forty miles; but only portions of it are visible at any one time, as in order to expose it to view a vast body of sand and shingle must be cleared away by the force of the waves. As the sea is always gaining on the land in that district, new sets of trees are brought to light from time to time, so that the breadth as well as the length of the ancient forest land seems to have been considerable. The forest must have existed for a long time, since, besides the erect trunks, some of

* "The Geological Evidences of the Antiquity of Man." By Sir CHARLES LYELL, Bart., M.A., F.R.S. Fourth edition, 1873, pp. 331–2.

them two to three feet in diameter, there is a vast accumulation of vegetable matter in the immediately overlying clays. Between the stumps of the buried trees and in the lignite above them are many well-preserved cones of the Scotch and spruce firs. Professor Heer has identified amongst the plant remains those of the Scotch and Spruce firs, Yew, Yellow water-lily, Hornwort, Pondweed, Common sloe, Buckbean, White water-lily, Alder, Oak, and Birch. The insects, so far as they are known, including several species of *Donacia*, and also the freshwater shells, are, like the plants, of living species. Mr. Boyd Dawkins has identified a total of 26 species of Mammals from the Forest, of which 16 are extinct and 10 recent. On the authority of Professor Owen, at least four other species, all of existing forms, may be added to the list. The forest bed is overlaid by a great accumulation of deposits divisible into five distinct zones or horizons.

With regard to the extent of the submergence during what may be called the inter-continental period, it will be remembered that Sir C. Lyell speaks of it as having converted the land north of the Thames and Bristol Channel, and that of Ireland, into an archipelago, thus allowing it to be inferred that the part of England south of the line specified was but little, if at all, affected by it; and this, as was intended, is positively conveyed to the eye by his Map representing the condition of the British Isles and part of the north-west of Europe during the submergence.* Nevertheless, being not quite satisfied that this is a correct view of the case, I have elsewhere pointed out that there is conclusive evidence that the south of England participated to at least some extent in the submergence, and that there are facts which apparently require us to believe that the whole of Devonshire shared in the downward movement so far as to carry it at least 800 feet below its present level.†

But, be this as it may, geology not only countenances the idea that Britain has been in a continental condition in what may here be called recent times, but it actually teaches that within such times it has *twice* been in that condition; that during some part of the interval it was submerged greatly below its present level; and

* See "Antiquity of Man," Fourth edition, fig. 42, p. 325.

† See "Trans. Devon Assoc.," vol. vi. pp. 221-2. 1873.

that the glacial period, or, more probably, periods, embraced the era of great submergence and also that of the last great elevation. I repeat that the interpretation I venture to put on the Kent's Cavern facts is that the Hyæna first reached Britain during the last continental period, but that man occupied Devonshire prior to that. It must be unnecessary to say that if this be accepted it will follow that unless the earliest Devonshire men of whom we have at present caught sight possessed some means of navigation, they must have arrived here during the *first* continental period; and that to this conclusion we must also be driven if, as seems probable, Devonshire participated to any considerable extent in the great inter-continental submergence. In other words, the men of the Ursine period of Kent's Cavern were either of glacial, or, more probably, of pre-glacial age.

At this announcement the following questions may be expected to press forward for consideration:—1st. What light does Palæontology throw on the absence of the Hyæna in the fauna of the Cavern Breccia? 2nd. What is the relation of this opinion respecting the age of man in Britian, to that expressed by Sir C. Lyell in the last edition of his great work on the Antiquity of Man, published in 1873?

1st. Assuming it to be true that the Cavern Breccia was deposited before the second, but not before the first, continental period, it must be admitted to be of great importance in this argument to ascertain, if possible, what mammals occupied this country during the earlier of these two periods; for, since no terrestrial mammal could have travelled hither in the intermediate period of great submergence, unless they made the voyage on icebergs, there should be nothing conflicting between the first continental fauna as found elsewhere and that of the Breccia. Bears, for example, may be reasonably looked for in the one since they are known to occur in the other; and, on the other hand, it would certainly be remarkable to find *Hyæna spelæa* in the first continental list of British Mammals, seeing that it forms no part of that of the Kent's Hole Breccia.

The most complete evidence respecting the mammals which occupied Britain during the first continental period appears to be that furnished by the Forest bed of Cromer, which according to Mr. Boyd Dawkins has yielded the following 26 species:—1. *Sorex*

moschatus, Linn., = Musk rat; 2. *S. vulgaris*, Owen, = Common shrew; 3. *Talpa europæa*, Schm., = Common mole; 4. *Trogontherium Cuvieri*, Fisch.; 5. *Castor fiber*, Owen, = Beaver; 6. *Ursus spelæus*, Blum., = Cave bear; 7. *U. arvernensis*; 8. *Canis lupus*, Linn., = Wolf; 9. *C. vulpes*, Briss., = Fox; 10. *Machairodus* sp.; 11. *Cervus megaceros*, Owen, = Gigantic Irish deer; 12. *C. capreolus*, Linn., = Roe deer; 13. *C. elaphus*, Linn., = Red deer; 14. *C. polignacus*, Falc.; 15. *C. carnutorum*, Dawk.; 16. *C. verticornis*, Dawk.; 17. *C. sedgwickii*, Gunn; 18. *Bos primigenius*, Boj., = Wild bull; 19. *Hippopotamus major*, Nesti, = Great hippopotamus; 20. *Sus scrofa*, Linn., = Common wild pig; 21. *Equus caballus*, Linn., = Common horse; 22. *Rhinoceros etruscus*, Falc; 23. *R. megarhinus*, Christol; 24. *Elephas meridionalis*, Nesti; 25. *E. antiquus*, Falc.; 26. *E. primigenius*, Blum., = Mammoth.*

It is satisfactory to find from the foregoing list, that the Forest bed of Cromer, like the Kent's Hole Breccia, *does* contain remains of Bears, including the Cave bear; and that the two deposits agree also in neither of them having yielded any relics of the Hyæna. So far therefore as Palæontology can throw any light on the question it is decidedly to the effect that if the Kent's Hole Breccia was deposited before the second continental period it is not to be expected that remains of Hyæna will be found in it. It must be unnecessary to remark that should further researches in the Breccia disclose traces of any other of the Cromer species, there will be nothing surprising in the fact, as they may have been washed in with the fragments of grit. The only thing that can prejudicially affect the argument employed here would be the discovery of remains of the Hyæna in the oldest known deposit in Kent's Hole, or in beds, which like the submerged Forest of Cromer, belong to the first continental period. It should be added that should the Hyæna itself be found hereafter in the Cavern Breccia, or at Cromer, or both, it would simply vitiate the particular evidence here adduced in favour of the glacial or pre-glacial age of British men, and it would leave the question of so great an antiquity for man an open question to be proved or disproved by other evidence.

2nd. I am not aware that Sir C. Lyell has written anything on

* See "Cave Hunting," by W. Boyd Dawkins, M.A., F.R.S., F.G.S., F.S.A., 1874, p. 418.

Human Antiquity since he has had an opportunity of studying the new evidence, nor can I say whether it has occupied his attention, or whither it would probably lead him. Though he is the chairman of the Committee charged by the British Association with the exploration of Kent's Hole, it must be distinctly understood that neither he nor any other of my colleagues is committed by this paper to anything more than the bare facts which it contains. The inferences I have drawn and have submitted on this occasion are mine, and so far as I know they may be, I do not say that they are, mine only. In order to show, however, the latest expression of opinion by Sir C. Lyell on the question of Human antiquity, the following passages may be quoted from the latest edition of his great work (4th ed. 1873):—

"The Glacial period when the boulder-clay was accumulated, limits so far as our knowledge yet extends the appearance of Man in England" (p. 267).

"The oldest memorials of our species at present discovered in Great Britain are post-glacial, or posterior in date to the boulder-clay" (p. 271).

"The earliest signs of Man's appearance in the British Isles, hitherto detected, are of post-glacial date, in the sense of being posterior to the grand submergence of England beneath the waters of the glacial sea" (p. 273).

"It was during this second continental period that Palæolithic Man probably inhabited Europe together with the mammoth and woolly rhinoceros, or with the *Elephas antiquus*, *Rhinoceros hemitæchus*, and *Hippopotamus major*" (p. 332).

It is obvious from the foregoing passages that Sir C. Lyell supposed Man to have been in Britain during, but not before, the second continental period; whereas I, having the new evidence before me, hold that he must have been here prior to that time. We may feel assured that the eminent author just quoted merely expressed the opinion to which the facts then known had led him; and by no means intended to definitively and finally dispose of the question. Indeed, the possibility of sooner or later discovering evidence of a higher antiquity, of taking Man, in short, back to the first continental period, must have been prominently before him. "For the present," he says, "we must be content to wait and consider that we have made no investigations which entitle us to wonder that the bones or stone weapons of the era of *Elephas meridionalis* [of the

first continental period] have failed to come to light. If any such lie hid in those strata, and should hereafter be revealed to us, they would carry back the antiquity of Man to a distance of time probably more than twice as great as that which separates our era from that of the most ancient tool-bearing gravels yet discovered in Picardy or elsewhere" (p. 272).

"I trust I have said enough to show that the monuments of the glacial period, when more thoroughly investigated, will do much towards expanding our views as to the antiquity of the fauna and flora now contemporary with Man, and will therefore enable us the better to determine the time at which Man began to form part of the fauna of the northern hemisphere" (p. 412).

In closing these remarks respecting the views of Sir C. Lyell, and speaking for myself only, however far back in antiquity the fabricators of the Cave-earth tools take their stand, I cannot hesitate to place those of the implements of the Breccia as much further back. Many must remember, and perhaps few were surprised at, the excitement and, indeed, the alarm occasioned by the antiquity of Man disclosed by the researches in Brixham Cavern, in 1858; and now, cavern researches growing out of those just mentioned appear to me to make an irresistible demand to have human antiquity in Britain at least doubled.

It is not unusual, nor is it perhaps unreasonable, when this subject is discussed in a mixed company, for some one to say "How long ago did the Cave-men live?" To request, in fact, that geological time should be reduced to astronomical. Unfortunately this is not possible at present. Mr. (now Professor) Prestwich, speaking on this point before the Royal Society of London, in June 1862, said, "Just as, though ignorant of the precise height and size of a mountain range seen in the distance, we need not wait for trigonometrical measurement to feel satisfied in our minds of the magnitude of the distant peaks, so with this geological epoch, we see and know enough of it to feel how distant it is from our time, and yet we are not in a position at present to solve with accuracy the curious and interesting problem of its precise age."* Since these striking words were uttered, no advance has been made towards the numerical solution of the problem, but the problem itself has assumed much larger dimensions, for the Crystalline

* "Phil. Trans." 1864. Part ii. p. 303.

Stalagmite and the underlying Breccia of Kent's Hole—deposits necessarily vastly older than the most ancient in which human relics had then been found—were not at that time discovered or even suspected.

Whilst, however, Science modestly declines to say how many times the earth has rotated on its axis, or revolved round the sun, or how often the pole of the equator has travelled round the pole of the ecliptic since the fragments of red grit were carried into Kent's Cavern, it is, perhaps, possible to throw in a few stepping stones enabling us in imagination to cross, step by step, the stream of time which separates us from the earliest known men of Devon, and to form a more adequate notion of its breadth than would be attainable by looking at it in its entirety.

There are five lines of enquiry, or five kinds of evidence, which may be here considered. First, the Cavern deposits, or the *Geological* evidence; secondly, the animal remains found in them, or the *Palæontological* evidence; thirdly, the human industrial relics which have been exhumed, or the *Archæological* evidence; fourthly, the changes in the configuration of the surface of the district adjacent to the Cavern, and, still more important perhaps, the alterations that have taken place in the relation of Britain to the Continent, or the *Geographical* evidence; and, fifthly, the thermal changes, or the *Climatological* evidence. It would be absurd to attempt a full discussion of even one of those topics on this occasion, and the time at my disposal forbids me to do more than to make a few general observations.

Archæologists have found it convenient and possible to divide all human time as represented in Western Europe into certain distinct Ages, of which that in which we live, or the first, if it is allowable to read History backwards, is the *Iron Age*. Taking the labours and discoveries of archæologists as our guide, there was an early time when Iron was not used, but men fashioned their most powerful tools in the compound metal called Bronze—a mixture of copper and tin in definite proportions—and the period thus characterized is denominated the *Bronze Age*. Proceeding thence to a more remote antiquity, a time is reached when metals seem to have been entirely unknown, and the most efficient tools were made of hard stones, chiefly flint and chert, which were generally elaborated with great care, and finished by polishing. In still more ancient times,

taking the geological test of superposition as our guide, men employed stone tools which were merely chipped into shape but were never polished. It is obvious therefore that human pre-metallic times in Western Europe, or the period of stone implements, is divisible into two Ages. The most modern of these has been termed by Sir John Lubbock the *Neolithic Age*, that is the age of *New* or *Polished* stone tools; and the most ancient, the *Palæolithic Age*, that is the age of *Ancient* or *Unpolished* stone tools.

Whilst both the Hyænine and Ursine tools of Kent's Hole are strictly palæolithic, the latter are unquestionably older than the former, and in order to distinguish them I propose to call those *Archaic* which are found in the Breccia—that is the older, ruder, and more massive series;—reserving the term *Palæolithic* for the implements of the Cave-earth—the less ancient series.

Before proceeding further, it may be well to add to the foregoing description a few cautionary remarks.

In all probability the line separating any two successive Ages was not sharp or well-defined. Thus, it is not unlikely that after men had seen that their stone tools would be more efficient if polished, they would still occasionally employ unpolished tools, especially in cases in which they would be equally useful; and it is eminently probable that after metallic tools had come into general use, whilst polished stone implements, on account of the labour required to produce them, would drop into entire desuetude, except on great and rare occasions, unpolished flint tools would still be struck off and used for rough-and-ready purposes.

Nor must it be forgotten that all men are conservative; and were it not that I might be suspected of having a political meaning —than which nothing is further from my thought or intention— I would have said that their conservatism is great in proportion as their culture is small. There is a reluctance on the part of the many and the uneducated to part with old usages, old agencies, and old tools; and this is notably the case in matters of ceremony and of ritual. Hence the unpolished implement, the "sharp stone," may have been employed for sacred uses very long after it had ceased to be the most *useful* tool for the purposes.

Waiving all this, however, the presence of a polished flint implement must be taken as a proof of the Neolithic Age, even though found with unpolished implements, provided no metallic tools were also found. Further, the palæolithic tools belong to

the era when some of the mammals then living were of species which had become extinct before historic times. Hence, whilst a geologist would hesitate to pronounce a deposit of palæolithic age merely because he had found in it a solitary unpolished flint implement, his hesitation would vanish in a moment if he also detected a relic of the Cave bear, or Woolly rhinoceros, or any other extinct mammal.

It must be scarcely necessary to say that the materials used for tools and the character of the tools themselves are nothing more than indications of states of civilization, and cannot be taken as representatives of definite periods of time for the entire world. The scheme just described is intended to apply to Western Europe, as already stated; and no attempt need be here made to open the question of its applicability to any other parts of the world.

Again, the successive Ages were not necessarily or probably of equal duration. It is probable, however, that the tenacity of any phase of civilization amongst any human race may be safely regarded as a direct function—to speak mathematically—of the rudeness of that phase; the greater the one the greater the other. Whether the men who polished their flint tools were the descendants or the conquerors of those who did not, it may not be possible to determine, though the question must be one of grave chronological significance.

It is, no doubt, true that by following the geological method, evidences of a rude civilization may sometimes be found deposited on such as indicate a comparatively advanced state of society. This was, of course, the case in Britain when Saxon rudeness followed Roman culture; but whilst the Archæologist must not lose sight of their possible occurrence, such cases are in all probability very exceptional.

Whilst, however, it may be comparatively easy to determine the Age to which a given relic belongs, that determination will do little or nothing to fix its date in years, or to determine the chronological value of the intervals between our successive stepping stones. To assist us in this matter let us proceed to Denmark, where the naturalists have found a scheme of chronology in the peat bogs.

Denmark has been described as a land of beech trees, and on the surface of its bogs are found the *débris* or refuse of trees of

this kind. This covers a mass mainly derived from oaks having acorns with a long foot-stalk, and therefore termed the *Pedunculated Oak*. Below this are the relics of the *Sessile Oak*, so named from its acorns having little or no foot-stalk. Still lower are trees of a different kind again, amongst which the Scotch fir, *Pinus sylvestris*, is by far the most prevalent. Thanks to the Romans, we know that the beech held possession of Denmark 1,800 years ago; hence it had taken possession of the soil some time before that, and probably 200 years may be safely allowed for this, as a minimum. As this tree shows no intention of giving up possession, we may add 500 years to the foregoing figures as representing the time during which it would remain the characteristic Danish tree; making a total of 2,500 years as the chronological value of one term of the four which make up the bog series. The Scotch fir, the representative of the lowest or oldest term, does not now grow in Denmark, nor can even the horticulturist prevail on it to do so. Were we to assign 2,500 years as the mean value of each term, the entire bog would be worth 10,000 years. This, however, would be but a guess, and perhaps a rough one, of which all that can be said is that it is quite as likely to be below as above the truth. The bog, however, contains human industrial remains, amongst which iron tools occur; but they are found not to extend below the *débris* of the beeches. Below them are articles of bronze, which pass through the zone of the pedunculated oak and about half-way through that of the sessile variety. The lower depths are occupied with stone tools, all belonging to the Neolithic or polished kind. Steenstrup, a name which, did it need it, would make Denmark famous, took, with his own hands, a polished stone implement from beneath the prostrate trunk of a Scotch fir. Whatever may be the value of the Danish bogs in time, it is less than that separating us from the Palæolithic Age.

The bogs are also rich in animal remains, but from top to bottom they are those of existing species. The peaty masses, though having an age to be estimated in several thousands of years, have failed, as we have seen, to make known to us a time so ancient as that of unpolished stone tools, and they equally fail to take us back to the era when there were on the earth any animals differing from those which now occupy it.

In proceeding to co-ordinate the Kent's Hole deposits with the

Archæological Ages of Western Europe, the Peat bogs of Denmark, and the Geographical changes which Britain has undergone, we, at the outset, encounter the fact that the Cavern series is incomplete. There is one term missing. It has yielded no Neolithic implements. The uppermost deposit, the Black Mould, certainly extends back to pre-Roman times; it must represent two thousand years as a minimum, and may represent a very much longer period; but there is no reason to suppose that it goes back to Neolithic times. In passing from it to the Granular Stalagmite on which it immediately lies, we step at once from the era of metals, and of animals all still living in Western Europe, and almost all of them in Devonshire, back to the Palæolithic Age and the times of the extinct Mammoth and his contemporaries. There is here, no doubt, an unrepresented interval, the value of which cannot be estimated.

But waiving this, it is obvious from what has been said, that neither the Peat bogs of Denmark, with their successive zones of Beech, Pedunculated Oak, Sessile oak, and Scotch fir, nor the successive Ages of Iron, Bronze, and Polished Flints, can take us back further than to, if so far as, the *top* of the Granular Stalagmite. To enter this deposit, no matter how shallow the depth, is to disclose an extinct fauna, and to enter periods having an antiquity greatly exceeding theirs.

These older periods are represented by a sheet of Granular Stalagmite in some cases fully five feet thick, to which accretions are still being steadily made, but at the rate of not more than one-twentieth of an inch in 250 years. Earlier still, was the period of the Cave Earth, representing a prodigious amount of time it cannot be doubted, during which vast numbers of herbivorous and carnivorous animals lived in this country; when the Hyæna made the Cavern its home, and dragged into it portions of such animals as it found dead in its neighbourhood; when the whole of Western Europe stood at a level considerably higher than at present, and Britain was a part of the continent. Earlier than this, was that period during which the Cavern deposits older than the Cave Earth were broken up and dislodged by some natural agency, of which the exact character appears to be undiscoverable. In times still more ancient, an older Stalagmite, of vastly greater thickness and of a totally different texture, was laid down throughout the Cavern, and, unless it was the product of conditions so utterly unlike such as now obtain that to imagine their existence is but to

take another road into antiquity, this must have absorbed an amount of time which from its vastness the mind fails to apprehend. And further back still and earliest of all, we find the Cavern receiving a deposit, utterly unlike the Cave-earth and certainly derived from a totally different source, in which were inhumed an enormous number of bones and teeth, but without a trace or indication of the Hyæna amongst them; when Britain was either an island, or more correctly an archipelago of small islets, with icebergs floating in its seas and grounding on its shores; or, what is far more probable, when, on the ancient side of that era of great submergence, it for the *first* time during the Pleistocene era was in a continental state; when the climate was more genial than it is at present; when the Glacial Ages had not commenced; and even the *Elephas meridionalis* still existed.

Even at that early time Devonshire was occupied by men, whose rude flint tools have recently been found in Kent's Hole. They are probably the earliest human beings of which Science has yet caught a glimpse; but, warned by experience, it is felt to be unsafe to call them *Primeval Men* or the *Autocthenes of Devonshire*, since further discoveries may await us. They are satisfactory evidence of the vast *antiquity of Man in Britain*, but unless our comparatively ungenial Island was, or was near, the cradle of the human race, this must fall very far short of the *antiquity of Man in the world.*

Up to the present time, as Kent's Cavern has disclosed more and more ancient men, it has shown that they were ruder and ruder as they extended into antiquity. The men of the Black Mould had a great variety of implements, they used spindle whorls, and made pottery, and smelted and compounded metals, and wore amber beads. The older men of the Cave-earth made a few bone tools, and used needles, and could produce fire, and they even perforated the teeth of mammals to enable them to be strung as necklaces or bracelets; but they had neither spindle whorls, nor pottery, nor metals of any kind; their most powerful weapons were made of flakes of flint and chert, many of them symmetrically formed and carefully chipped, but it seems never to have occurred to them to increase their efficiency by polishing them. The still more ancient men of the Breccia have left behind them not even a single bone tool, and no indication that they were acquainted with

fire; they made implements of nodules, not flakes, of flint and chert; tools that were rude and massive, had but little regularity of outline, and were but roughly chipped.

Whether these old Cave-men, more and more rude as they were more and more ancient, were or were not incapable of anything beyond their savage state I will not venture to say; but if they were the degenerate descendants of men pretty much like ourselves in powers and gifts, their intellectual progenitors are necessarily shrouded in an antiquity much greater than even that with which we have been dealing, and sooner or later it may in that case be expected that deposits older far than the most ancient yet met with in Kent's Hole will yield a number, a variety, and a style of human industrial remains that shall utterly eclipse the comparatively rude, yet eminently precious, human relics which I have had the pleasure of describing from Kent's Cavern. When they are produced Science will it may be hoped be prompt to recognize and welcome them; and if they should never be forthcoming, it is equally to be hoped that Science will ask the advocates of degeneracy to account for the fact.

THE PRINCIPLES ON WHICH EDUCATION SHOULD BE BASED.

ABSTRACT OF MR. W. F. COLLIER'S PAPER.

(Read February 25th, 1875.)

THE education of the mind may be said to be the most important subject to which the attention of mankind can be directed. In considering the education of the mind, it is obvious that the mind itself must be our first study, for we cannot cultivate successfully that of which we know little or nothing. The study of the mind is called psychology, and in making an inquiry into the nature of our minds, we are conscious of its consisting of three plainly marked divisions—the feelings, the intellect, and the will. A sound system of education ought, therefore, to be based on the cultivation of those divisions, each being cultivated with a due regard to the effect to be produced on the whole. In treating of education, we have to recognize the fact, that minds differ before education can begin. It is impossible to estimate the relative power of the original mind, and the education by which it is developed; but that they are two forces, and that education is a very influential one, we do not doubt. To educate the mind from infancy to manhood, the feelings, the intellect, and the will must be so cultivated that the whole may be in as perfect a state as possible for the enjoyment of the individual and the human race, the good of the individual being the same as that of the race; for, if all individuals are taken into account, no distinction can be found.

In considering first the cultivation of the feelings, it will be found that they consist of different kinds, and that a further analysis is necessary. They are divided into the sensations and the emotions, or the peripheral and central. The sensations are known as the five senses—seeing, hearing, smelling, tasting, and touching—the result of impressions received from without; and also hunger, thirst, the

toothache, and so on, originating within us. We shall have no difficulty in recognizing the importance of cultivating the outer sensations, because we know that all success in the arts and sciences depends on the sight, the hearing, the touch, and so on. Professor Tyndall has very recently called attention to the importance of touch. The exercise of all these sensations begins from infancy, but their cultivation may be good or bad, efficient or non-efficient. We may be sure that a random, haphazard mode of proceeding falls far short of what is required. The cultivation of the inner sensations should not be neglected, because many of them are indications of health or disease. The cultivation of the emotions is a very important subject, the neglect of which appears to me to be very conspicuous in existing systems of education. They may be divided for the present purpose into sympathy, love, courage, admiration, hatred, fear, anger; though this cannot be taken as a complete analysis.

The lecturer then dealt with each of those divisions separately, showing the importance of bestowing on each a systematic cultivation—the good emotions to be encouraged into vigorous growth, the bad ones to be pruned or eradicated. He laid particular stress on sympathy, saying, What evil is there that well-directed sympathy may not cure? what good is there in us of which it is not an essential ingredient?

The second primary division of the mind is the intellect, on which so much pains is expended in all systems of education, to the exclusion almost of the others. If we reflect on the nature of the intellect, we find that it consists of subdivisions that differ distinctly from one another—these are memory, imagination, and reasoning. In the cultivation of the memory, which a moment's reflection enables us to pronounce of such vast importance to our welfare that it is difficult to conjecture what would remain to us without it, it is surely necessary to proceed from infancy onwards, with a due regard to the principles of which memory consists. A child is expected to remember what it is taught, but it is rarely taught how to remember. The questions that demand consideration are, of what particular faculty of the mind does memory consist, and what is the best method of cultivating so valuable a power. I contend that there ought to be a system of cultivating the memory, recognised as such apart from all other objects, in any sound scheme of education.

Imagination is a faculty capable of affording us the highest and most refined pleasure, and we have Professor Tyndal's authority for considering it of the greatest utility in the pursuit of the sciences. The imagination, however, must be cultivated as the imagination, and as nothing else. It is a very common error to mistake the imagination for the memory. The use of the memory is very suggestive of the use of the imagination, and it would be well if no confusion could arise in the use of both—a strong reason for special cultivation.

Our reasoning power I have placed last of the divisions of the intellect, though I need hardly say they are not least in importance. As, however, they cannot be exercised without the memory, and as Professor Tyndal points out how they are assisted by the imagination, I have thought it best to consider the other two divisions first. The cultivation of the reasoning powers demands the same special care that all the divisions of the mind require. Reasoning leads to judgment, correct judgment being the result of well-performed reasoning. It is evident that judgment is neither memory nor imagination. Mathematics are rightly considered as excellent training for the mind, but they would be much more efficient if the reasoning powers were submitted to special cultivation. By the study of mathematics, the reasoning powers are led to look for positive results. In the acquisition of knowledge, they are required to take propositions and assertions on authority without question. Here are two opposite extremes, between which the ordinary reasoning powers, so much required in every-day life, are left to cultivate themselves. Thus it seems to me that there is too common a tendency to hold positive opinions on subjects that do not admit of positive opinions at all.

I now arrive at the third and last primary division of the mind —the will, which many may consider the most important of the three. "A character," says Novalis, "is a completely fashioned will." I hope particularly to avoid provoking any discussion on the much vexed question of the freedom of the will. Let that be assumed if necessary. All our most important acts are under the direction of our will, and our will springs from our desires, which form the motives for the exercise of our will. To cultivate our will is therefore to cultivate our desires. When a person is said to have a strong will, it is because he has a very strong desire to attain an object to which all other desires are subordinate. When a person

is said to have a weak will, he has no very prominent desires that keep others in subordination, and his motives and his will are made up of every passing influence. It is the great work of education, the greatest work, we may say, to form desires that are of the most use to us, and by strengthening them to impart to them a predominant influence over the rest. This is to be done by placing their object and purpose before the mind in very strong contrast with the insignificant and frivolous desires that render us amenable to every transient impulse. What a field for cultivation is here! I have applied the word cultivation throughout this lecture to the treatment required for the development of the faculties of each division of the mind separately considered, and the word education to the result attained in the effect on the mind as a whole. I also draw a distinction between the exercise of a faculty and its cultivation. Cultivation implies exercise; but exercise by no means implies cultivation. A faculty may be exercised for no ulterior purpose; but it is cultivated for the sake of an ulterior purpose. It appears to me that the principles on which education should be based are such, that none of the varied treasures of the mind should be lost for want of care and cultivation.

THE ELOQUENCE OF DEMOSTHENES.

ABSTRACT OF REV. J. M. CHARLTON'S PAPER.

(Read March 4th, 1875.)

The principal positions maintained by the Lecturer were the following:

Demosthenes, considering the universal homage paid to him in ancient and modern times, may be regarded as holding among orators a position similar to that accorded to Homer and Dante among poets, or Aristotle and Plato among philosophers, and is, in his own department, equally worthy of attentive study.

A short sketch was then given of the life and times of Demosthenes, and the particular circumstances in which he was called to maintain the independence of his country against the aggressions of Philip of Macedon.

Definitions of oratory and of eloquence were attempted in distinction from the science of rhetoric and the practice of declamation.

The causes of the unrivalled eloquence of Demosthenes, in other words, of his power to convince and persuade, were found to consist in the following elements:

1. His complete mastery of the subject on which he addressed the Athenian assemblies.

2. The orderly and methodical arrangement of his matter.

3. His wonderful power, in which perhaps he was never surpassed, of *putting* things so as to bring them home with the greatest possible clearness and force to the common mind.

4. His wonderful command of the most flexible, copious, and expressive language ever spoken among men—the ancient Greek.

5. The noble and ardent patriotism which impelled him to put forth all his powers to maintain the liberties of his country. His oratory after all was only a means to an end, and that end the highest of which an ancient Athenian could conceive.

In conclusion, the lecturer expressed his regret that the Attic orators in general, and Demosthenes in particular, were so little read in our colleges and universities. He challenged the learned President to mention an instance in which an oration of Demades, Antiphon, or Isocrates had ever been selected as a Greek subject for examination in any school or college, and concluded with the words, Let our youth learn, if you please, the secret of harmony from Homer, "whose poem Phœbus challenged for his own," "thence what the lofty, grave tragedians taught in chorus or iambic." But let them

> "Thence to the famous orators repair,
> Those ancient, whose resistless eloquence
> Wielded at will that fierce democracy,
> Shook the arsenal, and fulmined over Greece,
> To Macedon and Artaxerxes' throne."

ON LIGHT.

Part I.

ABSTRACT OF MR. W. SQUARE'S, JUN., PAPER.

(Read October 22nd, 1874.)

Light was shown to consist of vibrations of definite length and velocity. That time was expended in the passage of light was explained by Olav Rømar's observations of the satellites of Jupiter, by Bradley's theory of aberration, and Fizeau's wheel. The laws of reflection and refraction were explained. Colour was shown to consist of rays of light simply differing in the relative length and velocity of their waves. The relations of the colours among themselves were explained; the complimentary colours, when mixed, made white. The chromatic scale of colours was proposed by M. Chevreul as a great improvement in the arts; the whole, mixed, made white. The theory of the colour of various objects was discussed, and the quenching of some of the returning rays shown to be the cause of their colour. It was experimentally shown how some rays quenched others. The division of white light into its various constituents was shown by means of bisulphide of carbon prisms. The spectra of various metals were exhibited, and Kirchoff's reversal of the D line. This was shown to be the cause of the production of all the Fraunhofer lines. Maps of these lines were shown illustrative of their number and order. The spectra of various gaseous substances were shown. The spectra of stars differed. They were regularly classed, the prime element in their classification being the fact as to whether they contained hydrogen or not. It was shown that planets differed much. Mars was like our earth in composition, while from spectroscopic observation it was inferred that Saturn was still in a highly-heated condition, and not habitable. The light from Jupiter, Saturn, and Uranus differs much from that of Mars, and the facts deduced from these differences have high astronomical importance. Many of the stars have spectra,

which induce astronomers to believe that the planets around them are inhabited, as they show the lines common to those substances that have to do with animal existence on our own world. The gas streams of the sun, which are projected to vast heights from the surface, are of hydrogen. Their rate of progress and decrescence is plainly and easily calculated by means of the spectroscope. The rate of motion of stars, as regards our earth, can be found out in the same way. Solutions of substances in glass cells interposed in the spectroscope are found to affect the lines much. The purity of many substances can be tested by the way in which the solution affects the spectrum.

Part II.

(Read March 11, 1875.)

Besides the division into colours, the spectrum was shown to be divided into heat rays, chemical rays, and light rays. The heat rays were situate at the red end, and outside the light rays the intensity was at its greatest. The rays behaved as the light rays in their reflection and refraction. A cell of iodine dissolved in bisulphide of carbon sifted out all the light, but allowed all the heat to pass, and substances were raised to a white heat at the dark focus. Chemical rays were situate at the violet end and beyond it. They were the rays of the photographer. They also were active in the production of colour in plants in the spring, when they are most energetic. The general rules of photography were explained, the camera, focussing, collodion, bath, developer, and fixing solution. A photograph was taken by the aid of the lime light, the various parts of the process being explained. Printing was explained, and also the Johnson autotype and the heliotype process. Various instances of phosphorescence and fluoreescence were shown and explained. The laws of diffraction, interference of light were touched upon, and the phenomena produced shown and explained. The fringes of monodramatic and compound light, Grimaldi's lines and Fresnel's experiments, the action of gratings, small apertures, and crossed fine lines were explained; also the colours of thin plates. The next subject was polarization of light. This was shown by means of the tourmaline plates, the Nicol prisms, and the bundles of plates of glass. Many pictures of selenite were shown, descriptive of the alteration of colour on turning the analyser,

and the way in which the various colours always stood in complimentary relationship. The action of various crystals was explained. Huyghen's law of the rotation of the extraordinary ray of Iceland spar, was experimentally demonstrated. In conclusion, the extreme delicacy of the eye as a recipient organ was shown. The marvellously small differences of wave length that were capable of being altered into nerve force to be appreciated by the brain.

METHOD OF THE PHILOSOPHY OF BACON.

ABSTRACT OF DR. WILLIAM H. PEARSE'S PAPER.

(Read March 25th, 1875.)

He commenced by giving a statement of knowledge and method prior to Bacon, with a general outline of Bacon's grand aim in the language of his axioms. The first part of Bacon's method was to cleanse the understanding, by removing the hindrances to knowledge. These difficulties flowed from the imperfection of the senses, the remoteness of nature, and from man's haste to assert, where he should rather have a suspension of judgment. The varied idols, or false views of the mind were pointed out; haste to assertion was second to none other as a cause of human error. The danger to truth from use of words was illustrated. Words were born to express common wants; but when with such meanings they were extended to wider and more exact subjects, error was created and established for long periods. Bacon confuted the different schools, such as the sceptical, empirical, and theological; all of which had hindered the growth of knowledge. Danger to truth from "affirmative instances" was glanced at. The doctrine of final causes had corrupted philosophy; "final causes were plainly of the nature of man, rather than of the nature of the universe." Bacon's great practice and method of Instances were dwelt on and illustrated; in this part of his philosophy Bacon had ranged over nature and gathered truth from every part; he had anticipated many of the great generalisations of modern science, both in the physical sciences and in natural history. His doctrine of Forms was shown to be that of ideas and truths of the widest generality. "Forms were the true object of knowledge, but these Forms must be confined

and determined by matter." Induction and Deduction were considered; true induction was not mere enumeration. Deduction, before Bacon's time, was the mother of all error; but the perception of intermediate forms (laws or order), from the highest, was true method. The alliances of the sciences, and the unity of method, were illustrated. The history of knowledge showed that wider and wider generalities were opening; they must be accepted; the greatest knowledge of nature, and the widest generalisations, were consonant with pure and living faith. Men must no longer deny faith, and the highest spiritual acceptances to other men who could not but believe in the highest generalisations and forms, and in the sufficiency of natural causes and series. Bacon said "the divine word itself did not operate upon the mass of things without order." It was vain to assert that a mere physical science would satisfy man's mental wants; it was as vain for men of fixed and narrow vision to attempt to limit the range of others who saw larger forms and laws in Nature. Bacon's philosophy conveyed that to fear to accept truth from fear of consequences was to "offer to the Author of Truth the unclean sacrifice of a lie." The study of the "Novum Organum," and the "Advancement of Learning," might well form a more prominent part of the higher education of the country: no other human works were so wise and wholesome; they were the temple of the harmony of the greatest knowledge with the purest faith.

SOME RECENT DISCOVERIES OF BUDDHIST RUINS IN INDIA.

ABSTRACT OF REV. S. BEAL'S PAPER.

(Read January 28th, 1875.)

This paper related chiefly to the discoveries of Buddhist ruins at Bharhut, in Central India. This place, in our maps, is called "Bharaod," and, as General Cunningham thinks, may be identified with the "Bardaotis" of Ptolemy. It is situated just 120 miles to the S.W. of Allahabad.

Here was the site of an old Stûpa which had long ago been destroyed. But some buried pillars and rails were disinterred on which various inscriptions were distinguishable.

The archæological surveyor of India having carefully collected these, found on them records of some importance. They were evidently of the age nearest to Asoka (B.C. 250). They were descriptive of sculptures principally relating to the Jâtakas, or former births of Buddha (Sâkya Buddha). Among these was the Jâtaka of Jânaka and Sivalidevî; there was also an account of the worship of Elapâtra Nâga paid to Buddha. The inscription is as follows: "Erapâto Nâgaraja Bhagavato vandate;" *i.e.* Erapatra the Nâgarâja worships Bhagavat. But Mr. Childers has pointed out that "*vandate*" must govern an accusative case (Bhagavantam); and therefore, if the inscription is correctly copied, there must be an omission of some such word as "Bôdhim." (Mr. Childers has since withdrawn this hypothesis.) But it seems to me (the lecturer) that the surveyor has possibly mistaken "vandate" for "namate;" and, as this last verb governs a dative case, that "Bhagavato" may after all be correct. Nothing but further and trustworthy emendations of the inscriptions can settle the question.

The other inscriptions on these ruins are of a highly-interesting character. There is one in which the chief minister of Jeta is engaged in covering the site of the Jetavana Vihâra with gold-pieces (masurans), the price of the plat of ground. Here we have an illustration of the phrase "suvarnasûtrâchtâpada nibaddham," which occurs in the "Lotus of the Good Law," f. 38, b. It is evident that the "Friend of the Orphans" is covering a space divided as a draught-board with pieces of money, and so purchasing the site for the future monastery. Mr. Fergusson's theory, that the two persons depicted are engaged in a game of "panchârî," or draughts, appears wholly untenable.

There is another suggestive group, in which the two principal figures are represented as "whistling" in joy by placing their thumb and forefinger in the mouth, and so producing a soft and melodious sound in token of their joy. This group also has been interpreted by Mr. Fergusson as "persons engaged in worship by holding their tongues between the thumb and forefinger"—an interpretation, as it seems, very forced and unnatural. Many other groups are of much interest, but cannot be entered on here. We are glad to find from the latest reports that the archæological surveyor has succeeded in discovering the site of Kapilavastu, the scene of Buddha's birth and early history.

THE LATE S. P. TREGELLES, LL.D.

We regret to record that while this Report is passing through the press the Society has been deprived of its most distinguished member, and England has lost one of the most learned of her sons. Samuel Prideaux Tregelles, although not actually by birth a Plymothian, may, from his long residence and family connections, be fairly claimed as a townsman. He was born at Wodehouse Place, near Falmouth, where his father was a merchant, January 30th, 1813. His father was related to the Foxes, and his mother was a Prideaux. From his earliest childhood he was remarkable for a most retentive memory. His education was conducted at the Falmouth Classical School by the Rev. Thomas Sheepshanks, and although he did not proceed to a university, the foundations of that knowledge which have so benefited the world were laid upon a sure basis.

We may conclude that before attaining the age of twenty-five he had set himself his great task. For some years before 1838 he had devoted much time to the critical interpretation of the Greek text of the New Testament; and in the August of that year he issued proposals—to use his own words twenty years after—"1st. For the formation of a text of the Scriptures on the authority of ancient copies, without allowing the 'received text' any prescriptive right. 2nd. To give to the ancient versions a determining voice as to the insertion or non-insertion of *clauses*, &c., letting the order of the words, &c. rest wholly upon the MSS. 3rd. To give the authorities for the text and for the various readings clearly and accurately, so that the reader might at once see what rests upon ancient evidence." Illustrative of his plan, Mr. Tregelles prepared a specimen, being a portion of the epistle to the Colossians; and from that time, although there were occasional interruptions, the work was steadily pursued to a worthy and successful end. No labour or expense was spared. In 1845 he published the first part of a translation of Gesenius' "Hebrew and Chaldee Lexicon of the Old Testament," a work much needed and most flatteringly received;

and in October of the same year he made his first journey to visit the great libraries of the Continent for the purpose of collating the various MSS., and a vast quantity of material was obtained. In subsequent years similar journeys were undertaken.

In June, 1844, he published the "Greek Text of the Book of Revelation from Ancient Authorities;" and in 1848 a smaller edition of the English translation only.

In 1850 the University of St. Andrew did itself honour by conferring on Mr. Tregelles its highest degree, LL.D.

In 1851 he printed a little book entitled "The Jansenists," a chapter in Church history, the result of a visit paid, in September, 1850, to Utrecht. Several other works followed from the pen of the diligent man of letters, who had now become famous, and whose ripe scholarship was acknowledged both in Europe and America. For the student he prepared "Heads of Hebrew Grammar;" and in 1852 "Hebrew Reading Lessons." In the same year (1852), he published three other works, "A Defence of the Authenticity of the Book of Daniel," "Historic Evidence of the Authorship and Transmission of the Books of the New Testament," and "Remarks on the Prophetic Visions in the Book of Daniel;" and also edited "Prisoners of Hope," a little book referring to the imprisonment of Francesco and Rosa Madiai. Soon followed "An Account of the Printed Text of the Greek New Testament;" and in 1856 he assisted in the production of the new edition of Horne's "Introduction to the Holy Scriptures." The year 1857 saw the publication of the first part of Tregelles' great work, "The Greek Testament," containing the gospels of SS. Matthew and Mark. His labours were now almost entirely concentrated upon this; and with the exception of the "Codex Zacynthius" and the "Codex Muratorianus, printed at the Clarendon Press in 1868, he afterwards published nothing of importance.

In 1862 a Civil List pension of £100 per annum was granted him, to which another £100 was added in 1870. He laboured diligently to complete the book which had so long engrossed his time and thoughts; and in 1872, after upwards of thirty years' incessant toil, he finished the last chapter of the Book of Revelation, and with it his life's work. The close study and anxiety caused by the conscientious way in which he had pursued his useful labours had had its effect upon his health. He was stricken with paralysis, his busy pen fell from his hand, and the literary

career of Samuel Prideaux Tregelles was ended. We must not omit to mention that when the arrangements were being made for the Revision of the Authorized Version of the Bible, as a matter of course Dr. Tregelles was invited to join the New Testament Company, but his refusal was inevitable.

He died at his house in Portland Square April 24th, 1875, after passing five years in more or less of bodily prostration, and with a gradual decrease of mental power consequent on the disease.

The religious opinions of Dr. Tregelles it would be out of place to discuss here; but some reference must be made to them. Although born of Quaker parents, he did not continue a member of the Society of Friends. He was connected for many years with the Plymouth Brethren, and frequently took part in the services. The last years previous to his illness he attended the ministry of the Rev. Joseph Wood, of the Presbyterian Church; and at Charles' Church (the Rev. H. A. Greaves). The whole of his writings show them to be the productions of a man imbued with strong religious feeling. From time to time he joined in the proceedings of institutions formed in Plymouth for the alleviation of the religious and temporal necessities of a large town.

He had been a member of our Society for many years, and was elected an honorary member about 1850. The few lectures delivered by him, upon the special subjects of his study, were of the greatest interest and value. Their substance was afterwards incorporated in his printed works. He used to join freely in the debates, and the writer recollects his evident enjoyment of the conversaziones and anniversary meetings. Indeed, he was fond of gatherings of this kind; and in company he was unbending and genial to a degree. In conversation no subject was foreign to him. He was able to shed a light upon any topic that might be introduced. A relative used to say that it was dangerous to ask him a question; doing so was like reaching to take down a book, and having the whole shelf-ful precipitated upon your head.

Those who knew the subject of our memoir in his later years, and heard him speak then, will find it difficult to believe, that before his throat became affected, he was a fluent and distinct speaker.

The life of Dr. Tregelles was an uneventful one, and presents few points for the biographer to dwell upon; but this sketch is due from us, and may serve as a record of the labours of a member

of the Plymouth Institution—one whose attainments were so vast, whose diligence was unexampled, whose patience never failed, and who with feeble health but firm resolve pushed on to the goal before him, and who has left a name never to be forgotten in the history of Biblical criticism, but to be handed down with no less honour than the great ones of Scholz, Lachmann, Tischendorf, and Scrivener. J. B. R.

THE AMMIL ON DARTMOOR.*

In January, 1868, towards the close of the day and in the course of the following night, a singular atmospheric formation took place on the Moor. Icicles, or rather coats of ice, appeared attached to and encircled every article exposed at the time to the open air. The weather was foggy, and the air unusually moist, with a degree of cold about freezing-point.

A member of the writer's family, who had walked from the Horrabridge Railway Station, and reached Archerton about dusk, was found, on entering the house, to have his clothes covered with minute specks of ice. When light returned in the following morning, the trees, shrubs, and grass were seen to be covered with icicles of various forms and sizes, and it was quickly announced by the Dartmoor people that "the ammil was on."

This consisted of a formation of a body of ice, which encircled every projecting object exposed to the open air, every stem, spur, berry, and leaf of the trees and plants, and every blade and member of the grasses, down to their finest and most minute particles, each particular stem, leaf, leaflet, blade, or berry bearing its own sepa-

* Mr. Shelly writes me to say, that "the name of the curious phenomenon you described last night is, I think, the old English *amell* (enamel). Palsgrave, in his French vocabulary (A.D. 1530), gives the verb, 'I ammell, as a goldesmyth dothe his worke. Your broche is very well amelled. Vostre denise est fort bien esmaillée.' Earlier than this we read of gold 'amiled.' Enamelling was, as you know, an art very much practised in England down to the sixteenth century; and it is curious to find this word "amell" surviving from the times when the work was very familiar, and used still by people to whom it is, of course, wholly unknown, and who employ the word in ignorance of its meaning."

rate ice-pendant, which took the form of the article encompassed by it—the pendant of the leaf taking the form of the leaf, the whole leaf being enclosed in a body of ice of about equal thickness throughout, the pendant of each blade of grass being in the form of the blade—the deposit or coat of ice being proportioned to the size of the body that bore it, a stout, leafless stem of a tree often bearing a pendant of more than a foot in length and an inch or more in thickness, whilst the smallest blade or particle of grass bore a pendant so minute and fine as to allow of its remaining suspended in a bent form without being quite weighed down to the ground.

In every case the form and colour of each imprisoned leaflet, stem, berry, or stick was distinctly visible through its coat of ice. The face of the ground on and far down the slopes of the Moor for many miles was covered with this strange formation.

The effect of the sun shining on a group of trees, or on the grasses and rushes on the ground, when the glassy pendants on all the objects and every projecting portion of every object on which the eye could rest gave forth their prismatic colours from myriads of centres at the same moment, dancing and sparkling in the breeze, was striking and beautiful beyond description.

There was a holly tree near the road between Princetown and Tor Royal full of green leaves and berries, partly red and partly green, which presented a spectacle of wondrous beauty, and was visited by great numbers of people during the day from miles around.

In one instance the ammil seriously frightened an old lady, Mrs. Webb, the occupier of a cottage at Post Bridge. Very early in the morning, long before light, she was alarmed by a thumping noise against the outside of her house, and made up her mind that it would be quickly broken through by thieves, or, perhaps, murderers. The knocking continued with increased violence till daylight came to her relief. On then opening her door and going out, she discovered that it was the ammil, which had bent down the branches of several tall trees upon the roof of her cottage, and drummed the honest woman almost out of her wits.

The cause of this phenomenon is, of course, to be found in the peculiar and very rare, and, perhaps, rapidly varying, conditions of the atmosphere at the time; but what those conditions were it is the province of the scientific to determine.

The ammil continued for two days and nights, and has not since returned.

The writer did not personally witness the phenomenon *in situ*, but he saw a specimen of the formation in the form of a large branch of a tree brought to Plymouth by the driver of a fly returned that morning from the neighbourhood of the Moor, who took it from his coach-boy, and showed it to him as a curiosity.

The ammil is rarely seen on the Moor, but it is understood that an appearance somewhat similar is sometimes witnessed in the northern counties of England, and occasionally in Canada; but it is not known that it is anywhere described in print.

A full note of this phenomenon was made at the time of its occurrence by one of my daughters, who witnessed it, of which the above is the substance.

J. N. B.

THE INSCRIBED STONES AND ANCIENT CROSSES OF DEVON.

Part I.

MR. C. SPENCE BATE'S PAPER.

(Read November 19th, 1874.)

The inscribed stones of Devonshire that remain are few, and most of those that are known stand in places to which they have been removed from their original sites.

There are three in the garden of the vicarage at Tavistock. Two of these were brought from Buckland Monachorum, and the third from the neighbourhood of Tavistock. These were obtained, and erected for preservation, by the late Rev. E. A. Bray, a former vicar. Another inscribed stone was found some few years since by Mr. Pearse, at Fardel, near Cornwood. This has since been removed by the late Sir Edward Smirke, and is preserved in the British Museum. In Yealmpton churchyard is another, in tolerable preservation, as also is the one in the churchyard at Stowford. Another exists, built into the wall, at Lustleigh. Nun's Cross, in the heart of Dartmoor, has an old inscription on it; and so has the one at Sourton, on the Okehampton Road.

Of these the first is one of the most interesting.

The Nabarr Stone at one time fulfilled the duties of a gatepost. The iron clamps that supported the hinge still remain imbedded in the side. It stood in a field near the village of Buckland Monachorum, and

was with great difficulty obtained by the Rev. E. A. Bray, and removed to its present site in the vicarage garden at Tavistock. It has been described and figured in Bray's "Legends of Dartmoor." Its most interesting feature, the Ogham inscription, he was not aware of, and consequently has not noticed.

The Ogham characters are to Ireland what the Runic inscriptions are to the North, and the arrow-head or wedge-shaped figures are in Babylon and Persepolis. They are more capable of being understood than the cuneiform characters, but less known and deciphered than the Runes. Until recently they were supposed to have been an imposture of the bards. Of late, however, they have been more carefully studied, and considerable light has been thrown upon them.

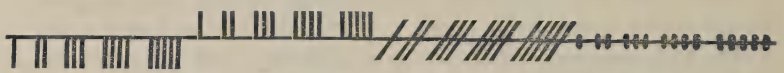
Much has been written by students and historians of the country on this Ogham character, which was represented as the sole depository of the remaining Druidic learning in ancient Ireland. The concurring testimony of many centuries declared and authorized the fact, and accordingly its origin, history, and use were descanted upon as matters of certainty, and its rules laid down in every Irish grammar; but previously to 1784 no one had ever seen it practically used, either on parchment or on any monument, consequently doubts were urged against it; and it was only by the evidence of some unimpeachable inscriptions that the public could be brought to place reliance any longer on these oft-repeated assurances and statements. Lluyd had, in the beginning of the last century, mentioned an Ogham-inscribed monument which he had seen at Dingle; but his statement was unknown to the literary world. It was therefore with much satisfaction that the announcement was made, in 1784, to the Royal Irish Academy, of the discovery of a veritable Ogham inscription on Callan mountain.

Theophilus O'Flanagan, the alleged discoverer, was despatched with instructions to show it to Mr. Burton, and the report of that gentleman was satisfactory. He found the stone and the letters covered with lichens, an evidence that they could not have been a forgery of O'Flanagan or of the present generation.

In 1838, in a field immediately adjoining the high road in the pass of Duloe, near the lake of Killarney, some workmen accidentally broke into a cave whilst engaged in constructing a ditch. The cave consisted of a chamber, the walls of which were stones inclining inwards, having a roof of long transverse stones. In the

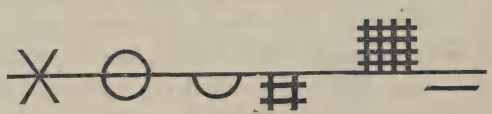
passage leading to the chamber were found several human bones and skulls. The stones that formed the roof had the angles marked with inscriptions of the Ogham character. The discovery formed a new era in our knowledge of the prehistoric writing of the Irish, by whom Ogham characters are stated to have been used long prior to the Christian era.

The alphabet consists of four series of scores, each series embracing five characters, and each letter being represented by one or more scores, but never more than five,—a circumstance suggestive of their having originated in signs made by the fingers, the digits on either side representing the fingers of the right or left hand respectively. The characters are placed on a line, which line is generally formed out of the corner or angle of the stone on which they are cut. This line is called a *fleasg*, and it is the number and position relative to this line that constitutes their value.



b l f s n h d t c q m g ng? er? r a o u e i

This line represents the alphabet; but different authors somewhat vary in their determination of the various letters; Dr. Ferguson doubting the correctness of those marked *ng* and *er*, while O'Hallan omits the letter *h*, and considers the doubtful *ng* to be the equivalent of the letter *r*. The formula consisted in the first place of sixteen letters only, which is considered to be strong evidence of its great antiquity, as this was also the number of the Phœnician, Pelasgic, Etruscan, and Celtarabian alphabets. The earliest piece of Ogham writing at present known is an ancient vellum MS. of the eleventh century, now preserved in the British Museum.



ea oi ui ia ao p

The vowels are represented by short lines or dots on the *fleasg*; the dipthongs by crosses, circles, and squares along the central line. The letter *p* is represented by a line longitudinal to the *fleasg*. The latter characters, represented in the second diagram, are stated to be of a later date. The writing has been called *craow*, or branch

Ogham, because it is supposed to bear a resemblance to that of a tree; the *fleasg* answering to the trunk or stem, and the scores on either side, or passing through it horizontally or diagonally, corresponding to the branches. On the majority of the monuments on which it is found, the angle is used to form the *fleasg* (central stalk).

There are, I believe, only two cases known—the famous Callan stone, and one other—in which the median line is cut in the face of the stone, and the digits formed on each side instead of at the angle of the stone.

In Hall's "Ireland," to which work I am indebted for much descriptive information, an account of the Callan stone is given by Mr. Windele as it appeared in 1838, and as it appears to bear a close resemblance to some of the cromlechs on Dartmoor and in Cornwall, the following extract may prove acceptable:

"We ascended the mountain on the south-east side, following the course of an old road, or rather bridle-path, until we came in view of a lonely cromlech, an old altar of the sun (Grian), to which the whole mountain in Paynim times was consecrated. It consists of three immense stones—two of them pitched on end, and the third laid incumbent on these, and forming the great sacrificial stone. The latter measures twelve feet in length by four in breadth; the others are each ten feet in length, eight broad, and one foot thick. Two more lie extended on the ground, closing, when erect, the extremities of the crypt, which the whole structure formed when complete. The interior had been recklessly excavated in search of treasure. The peasantry call this cromlech Altoir na Greine, or 'altar of the sun,' and also Leabba Diarmuid agus Graine; *i.e.* Diarmed and Grany's bed. Vallancey regards these as the names of the two Pagan deities of Ireland—one the god of arms, which Diarmit certainly signifies, and the other the sun itself; but the romancers have reduced these celestial beings to more mundane proportions. They form a portion of the wonder-working, all-enduring personages of the multitudinous Fenian legends of Ireland, chanted in musical prose by the itinerant story-tellers of old, and in verse by a host of bards, who from the earliest times down to the sixteenth century gave forth such lays of marvels under the one well-known and attractive name of Ossian. Tales like these formed, and still form, the amusements of the long winter nights to the inhabitants of the wild mountain districts of Ireland, as well as of the Highlands of Scotland, and served as the grand staple

of those very beautiful but mendacious poems which Macpherson published in the early part of the reign of George III."

The stone in the garden of the vicarage of Tavistock is about four feet high, and eighteen inches broad on the inscribed face. It is nearly of the same proportion from top to bottom, but has been fractured a little at the summit, and has a somewhat rounded top. The inscription on the stone is perpendicular, in three lines, and reads, "Dobunni Fabrii fili Ennabarri," according to Mr. Bray and Dr. Ferguson, but the author has failed to perceive the EN at the commencement, or the terminal letter I of this word.

During the summer of 1873, Dr. Ferguson, of Dublin, visited and took a cast of this stone, on which Mrs. Ferguson detected some Ogham writing. On his return to Dublin, Dr. Ferguson carefully deciphered the markings. The result of his examination he published in a paper read before the Royal Irish Academy, and it is embodied in the following abstract:

"The Ogham inscriptions of South Britain (understanding at present Wales and Devonshire) are distinguished from those of Scotland and Ireland, by being almost always accompanied by corresponding legends in the Roman character, and so, like the Rosetta stone, carrying their keys within themselves.

"Prior to 1870, the values of almost all letters of the South British Ogham alphabet had been ascertained in this manner. There remained only P, F, L, D, which were problematical, and B, which had not been found at all, to be identified.

"In December, 1870, it was pointed out that the equivalent of P was found in a certain combination of Ogham digits on the monument to *Turpill* at Crickhowel. F and L might be inferred from *fil*, the Oghamic equivalent of *filii* on the Tralony legend, as also F and D from their use in the name *(Doft a ceos)* on the Tycoed monument, of which a cast was made in 1872, disclosing hitherto unobserved portions both of the Oghamic and of the correlative Latin inscription.

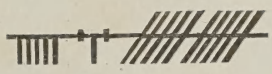
"The identification of *B* alone was required to complete the independent key to this class of Ogham characters. This has been accomplished by the discovery of an Ogham inscription on the angle of the well-known Dobunni monument from Buckland Monachorum, now preserved at Tavistock.

"The leading characters of the name *enabarri* of the Latin text are still legible in the Ogham *nabarr*, and the Oghamic representa-

tive of *B* is so ascertained without resorting to any external proof.

"External corroboration is however found abundantly in the substantial agreements of the results with those derived from the Irish lapidary Ogham texts, many of which 'echo' formulæ found in Latin inscriptions, and in one Ogham legend in South Britain. The manuscript keys to the Ogham alphabet preserved in the Irish books differ in one material respect from the South British, and from the generality of Irish lapidary texts, but agree with the Scottish examples; and the South British texts being older than the manuscripts, an inference arises that the Scottish Oghams are more recent than the others."

The following represents the Oghamic inscription on the stone:



n aba r r

The stone is irregularly square. On the upper portion of the back "G. C." are engraven, and probably represent some old boundary mark.

There are three names in three lines, and the inscription may be read as being in memory of Dobunnius Faber, the son of Ennabarrus; or, according to Mr. Bray, of Dobunnius the smith, the son of Ennabarrus; or of Faber, the son of Ennabarrus, one of the Dobuni.

Faber in later ages was no uncommon name, and meant a skilful workman in any art (more particularly in metal; for Faber has more especial reference to a smith or worker of iron). It would be of paramount importance in barbarous ages, that a man's trade or occupation would naturally become, not only an addition, but in itself a proper name; and probably it is so in this case, just as that of Smith in our own. It is also probable, Mr. Bray thought, that the first name in the inscription may have been that of his people.

According to Henry (p. 32), a part of the Dobuni submitted to the Romans. These were probably the subjects of Cogidunus, who became a great favourite of Claudius and succeeding emperors for his early submission and steady adherence to their interests.

Camden says that the Cassii had conquered the Dobuni before the arrival of Cæsar, who made the prince of this country commander-in-chief of the forces of the whole island.

This tribe inhabited Gloucestershire and Oxfordshire. They are

supposed to have derived their name *Duffen*, a British word signifying deep or low, because they inhabited for the most part a plain encompassed by hills.

Whether the name on the stone be that of an individual or of a nation, it certainly is, says Mr. Bray, of British origin.

On the reverse side are the letters G. C., which Mr. Bray presumes may stand for Galba Cæsare. But I can see little to induce us to follow Mr. Bray in this, except in his quoting from Shakespeare the following lines:

> "Figures pedantical, these summer flies
> Have blown me full of maggot ostentation:
> I do forswear them."

To be continued.

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